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Syracuse, N. Y., December 2-5, 1918

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Prepared for Publication by
THE BUREAU OF STATISTICS AND INFORMATION
Albany, N. Y.

331.82
In25p
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MONDAY AFTERNOON, DECEMBER 2

PRESIDING OFFICER: JAMES M. LYNCH, NEW YORK INDUSTRIAL COMMISSION, PRESIDENT OF THE CONGRESS

COMMISSIONER LYNCH: The Mayor informs me that it is necessary for him to return to the City Hall as soon as he possibly can, not later than half past two, because of some tradition that while the Common Council is in session the Mayor must be in the City Hall. He is unable to state whether it is necessary for the Mayor to watch the Council or the Council to watch the Mayor. I will, therefore, introduce the Honorable Walter Stone, Mayor of Syracuse, who will make the welcoming address on behalf of the City.

ADDRESS OF WELCOME

BY HONORABLE WALTER R. STONE, MAYOR, CITY OF SYRACUSE

Ladies and Gentlemen: I think the fact that it is the request of the Common Council that the Mayor be present during the session of the Common Council, while not meeting with them, would lead any one to believe that perhaps the Council thought the Mayor ought to be watched and ought to be located where he could be watched most easily, so we will have to let it go at that.

I am very glad to again have this privilege of welcoming to Syracuse the Safety Congress. Of course, the fact that you come here year after year is evidence that you must have believed and proven what I told you the first year, namely, that this is naturally the very best city that you could meet in. Our facilities for improving your minds and improving your enjoyment while you are here, making your enjoyment more easy to accomplish, have been proven or you wouldn't come back here again. The fact that it is easy to get hold of Commissioner Lynch because he lives here may have something to do with it, but I want to tell you that he is a very hard man to get hold of. I tried here about a week ago to locate him. I find he is all over the State most of the time, and I couldn't seem to locate him in one spot long enough to talk to him. I think you are fortunate in coming to Syracuse in order to be sure that the Commissioner is on hand.

It isn't my purpose this afternoon to give you a long or attempted discourse because you have speakers of the day whom you are waiting to hear, but I can't let this occasion pass by without saying just a word or two about what, it appears to me, must be in the minds of all of us, and that is our realization of the tremendous problems which will grow out of the actual peace which we expect to come in a few short weeks or months.

Now the war hasn't ended. The war has practically begun. We have enunciated, as a people, great principles which caused us to enter this world struggle. Now, until we, as a people, (and I believe this to be absolutely so) are willing to put into practice to the greatest and fullest extent those principles which caused us to enter the war in our own country, we can't expect to weigh very heavily in the balance of world Democracy as our representatives attempt to put those principles into practice in the European countries and throughout the world.

What I am arriving at is this: That it is your duty, it is my duty, as citizens of this great country of ours, to so shape our affairs, to so lend our interest in American affairs, that here in this country we will bring about such a condition of affairs that we can rightfully and properly say that we have a real Democracy.

There are great problems to work out, industrial problems, business problems, moral problems, problems of every name and nature that present themselves at this time in a more clear cut fashion than they have ever been able to be presented in the history of this country, and I am certain that our first task is to show the boys who are coming home to us with ideals and ideas born in their souls by the tremendous experience they have gone through with that we have a better country, a country where right and equity to all mankind is more carefully lived, and less easily spoken without having been lived, than it was before the time when these boys went away to fight for us and, if necessary, make the supreme sacrifice for democratic institutions all over the world.

I thank you on behalf of the city of Syracuse for having come here. I believe that you are doing this city a great deal of good in coming here each year and we appreciate it.

If it were not for the presence of some few in the audience whom I could name as being close friends of mine, I might say that I will turn over to you the key of the city, but I will say that you can go as far as you like, even if for the aforesaid reason I can't give you free rein and throw the key into the canal.

COMMISSIONER LYNCH: I suppose I ought to thank the Mayor for the implied compliment. I have always maintained that despite my size I could move rather rapidly, but it remained for the Mayor to give his testimony that I moved so rapidly that it was impossible for him to locate me.

For several Saturdays I have been acting the part of the Good Samaritan in dealing out compensation to injured working men, but I happened to recall while the Mayor was talking that on two or three of those Saturdays for about an hour or so I was engaged in purchasing articles of wearing apparel for a somewhat numerous family and that I was purchasing them in the emporium owned by the Mayor, so I presume that that was the last place he would look for an Industrial Commissioner.

Talking about compensation leads me to a consideration of the results of the two Safety Congresses that have been held in this city during the past two years, the two Safety Congresses preceding this Congress. I assume that there is no way of accurately checking up the results and the prevention of injury through these Safety Congresses. The only figures that the Industrial Commission has are those prepared as the result of the reporting of injuries to the Compensation Bureau, and inasmuch as each year the compensation law is broadened by including in the list of hazards many new occupations, it is obvious that a comparison of the number of accidents for the first year and the second year following each of the prior Industrial Safety Congresses would not give us an accurate or even a fairly comparative result of the influence of these Safety Congresses. When we add to that that during the past two years this country in preparation for war has been driven as it never was driven before, that its industrial establishments and especially its factories have worked at the highest speed that ever was known, that many new and unskilled wage-earners have been taken into these factories, toilers unacquainted with the processes and with the machinery, and thereby it is fair to assume that the rate of accidents has been largely increased, we are still much further at sea in estimating the value of these annual gatherings in Syracuse. Nevertheless, I think it will be conceded that they have a tremendous effect both on industry in the employing sense and on industry in the employed sense, and that with the return of normal conditions we will have reflected to a very valuable and to a very appreciable extent, the value of these annual meetings and their effect on industry in a decreased number of accidents, in a greater degree of safety in the workshop as experienced by the men and by the employer.

We have made a partial compilation of the accidents that occurred during the year ending July 1 of this year, these accidents, as I have said, being reported to the Compensation Bureau of the Industrial Commission. The compilation is not complete nor is it accurate, but it gives a fair idea of what the wage-earners in industry have suffered during that year. The Deputy Commissioner in charge of that Bureau informs me that the compensation claims for that year, for the year ending July 1, will fall between 50,000 and 51,000, and that means that more than 50,000 persons were injured so seriously that they were disabled for more than two weeks and that the number of accidents will probably fall between 285,000 and 290,000, which means that about 240,000 of those accidents were of such a nature as to disable the wage-earners and keep them from work less than two weeks.

If my memory serves me correctly, that is quite a considerably less number of accidents than occurred during the preceding year, and I think we are entirely within the bounds of reason if we take some credit to the fact that the Industrial Safety Congresses have been held and that they have aroused among employers and employees a renewed consciousness of the value of accident prevention.

On that phase of the work our Statistical Department has prepared for me some figures which have been arranged in such a way as to show the cost other than in money of the accidents that occur annually in this State, presenting the result of those accidents in a somewhat different phase than heretofore considered and a somewhat different aspect than I presented them in opening the First Industrial Safety Congress in this hall two years ago.

One of the considerations constantly cropping out in discussions of safety standards and safety work is that of the cost of the means of preventing accidents. This consideration undoubtedly has its proper place in this as in nearly all fields of human endeavor, but it is one which too often appears in the form of an argument against some device or method which otherwise seems reasonably promising of results for actual reduction of accidents. To some extent it would almost seem that compensation laws have had a tendency to increase the use of this dollars-and-cents argument, by creating the habit of discussing accidents in terms of compensation cost. There seems sometimes almost an inclination to assume that the reasonableness of a safety measure may be determined by comparison of its cost with the compensation cost of the accidents which it is designed to prevent.

Now from the point of view of society as a whole, such a consideration is, of course, sadly one-sided in that it ignores the element of human suffering caused by accidents, which must be reckoned in the account against them if we are to avoid the appearance of assuming that dollars may properly be weighed against human life, a position which, when bluntly stated in this way, not even the most "practical" man cares to assume, at least not in public.

But even on the ground of the dollars-and-cents argument, there is frequently a failure to realize how heavy the debit account actually is, so that it is well occasionally to recall some of the figures on the loss side of the ledger, to keep our view of even the dollars-and-cents aspect of safety work from becoming clouded.

As above suggested, it sometimes seems easy to speak of the cost of accidents as measured by the amount of compensation which the law requires to be paid for them. This, of course, is recognized as erroneous as soon as attention is given to analyzing all the costs. Turning, therefore, to some more adequate measure, it is proposed here to present some figures for New York State in terms of loss of production caused by accidents. Such terms we have recently learned to appreciate during the great war emergency when the paramount problem of producing enough food, fuel, munitions and other necessary supplies was forced upon our attention. Furthermore, loss of production is at all times an economic loss of basic significance for all concerned, employer, employee and society in general.

The Bureau of Workmen's Compensation reports that for the year ended June 30, 1918, there were in this State in round numbers 50,000 accidents serious enough to require compensation under the Workmen's Compensation Law, with 240,000 other reported accidents. As a measure of loss of production, the most suitable form of expression here is loss of working time occasioned by these accidents. Reckoning time loss in fatal and permanent total disability cases on the basis of average working life expectancy, and in permanent partial disabilities according to the best available data, and following earlier experience as to proportions of different classes of disability, a fair estimate of the total loss of working time occasioned by accidents in the year ended June 30, 1918, is something over 12,000,000 days in round numbers. Liberty loans and war finances have recently made us so familiar with figures in billions that twelve millions does not sound particularly large. Perhaps the figures will be more impressive when translated into other terms. That total is equivalent to the time loss which would be occasioned if the largest factory in this State (employing in round numbers 20,000 people) had been closed all that year and the year before also; or if 40 plants with 1,000 employees apiece had been closed all the year; or if 400 plants with 100 employees had been shut down throughout the year; or if every one of the factories and shops in the State with their million and a half employees had closed down for 8 days.

Let us go further with this measure of loss of production occasioned by accidents and translate the above time figures into the more familiar terms of dollars and cents. In the year 1914 the value of products manufactured in the State was, in round numbers, $3,815,000,000. This is equivalent to $12,715,000 for each working day. An eight days' shut-down for all factories, therefore, would have entailed a loss of product of $100,000,000 in values, with values what they were in 1914; in 1918 they were, of course, higher. All the time loss in accidents was not in manufacturing, but there was the same kind of loss of output in products or service in other industries as there was in manufacturing, and probably at similar values. It seems a reasonable estimate, therefore, to set up $100,000,000 as a conservative figure for loss of production chargeable to the accidents of the year ended June 30, 1918.

Bear in mind that even this does not compass the whole cost of accidents because there would also be the compensation which has to be paid, and the cost of medical care of injured employees, to swell the total. But leaving these items (not now ascertained for 1917–18) out of account, or to counterbalance any possible over-estimate in the above figure, let us carry in mind the good round sum of $100,000,000 of annual loss with which to compare proposed expenditures for safety work whenever the dollars-and-cents argument about the latter crops out. In the light of it, money spent in great sums for prevention of accidents looks like just plain good business. Of course, it is much more than that, because that kind of expenditure has the double sanction of being both good business and good social policy also in that it not only pays in dollars and cents but pays in human happiness by cutting down that other big account against accidents, not here dwelt upon, represented by the suffering involved in the hundreds of deaths, thousands of permanent injuries, and tens of thousands of serious injuries now annually in the record.

My friends, two speakers, one representing the employing side of industry and the other the side of the employee in industry, speaking on the same subject but from somewhat diverse view-points, will tell us what industry as a whole thinks of the work accomplished by these Safety Congresses.

I, therefore, have the pleasure of introducing to you now Mr. Carleton A. Chase, of Syracuse, President of the Associated Manufacturers and Merchants of New York State, who will talk to you on "What Organized Industry Thinks About the Year's Achievements in Safety Work."

WHAT ORGANIZED INDUSTRY THINKS ABOUT THE YEAR'S ACHIEVEMENTS IN SAFETY WORK

By Carleton A. Chase, President, Associated Manufacturers and Merchants of New York State

Mr. President, Ladies and Gentlemen: I assume, and my experience on this same platform last year bears me out, that I am given a place on this program not for what I know about Safety Work but because I am President of the Associated Manufacturers and Merchants of New York State. Having that in mind, it will not take me long to say what I have to say.

So far as the topic assigned to me is concerned, I can dismiss it in a word — organized industry knows that there has been great advance in safety work and that the money expended for such work has justified itself not only from the humanitarian standpoint but also from the financial standpoint. We all appreciate that the first duty of safety work is humanitarian; but all of us realize, too, that when I couple with it the statement that safety work has proved itself to be a success financially, it means practical assurance that there will be no lowering of standards. In business, as in every other walk of life, economy is economy only when it saves, whether it be a saving of productive power, of physical efficiency, of cash or what-not. The successful business is the business that is economical but not parsimonious,— and proper safety work is real economy.

While I appreciate that the framers of the program intended that I should speak for organized employers, yet, under the topic as outlined, I feel that I have been licensed to cut in upon the preserves of my friend, Mr. Holland, President of the Federation of Labor. I am one of those who believe that industry means all of us, the employee as well as the employer, and that industry never could succeed without the friendly co-operation of both. And I know you will forgive me if I dwell a little on this subject because it is close to my heart to-day, as it is close to the heart of every employer and, I believe, every employee.

We are entering upon an era of reconstruction. We have gained considerable knowledge in the preparation for war and in keeping war activities at one hundred per cent efficiency; but I am inclined to believe that we are almost as unprepared for peace, for the reconstruction from a war to a peace basis, as we were unprepared for war. With the lesson of our unpreparedness for war before us, I appeal to all of you to profit by that lesson and work as intelligently and as hard to fit ourselves for peace as we worked to fit ourselves for war.

There is only one way that this can be successfully brought about and that is by careful and patient consideration of the other fellow's view-point,— a real spirit of co-operation. The conversion of industry from a peace to a war basis was something that demanded instant, decisive action, with all its attendant errors, injustices and extravagances. The need for reconstruction is not so pressing and all of us who are to assist in this reconstruction will be judged not so much by the efficiency and the decisiveness of our actions as by the intelligence we bring to bear upon the greatest problem the country ever has had to face. We will need patience. Already I can see elements entering into the situation that necessarily must drive organized labor and organized employers together to a common ground. I seem to sense an underlying spirit of lawlessness, as potent as it is intangible, which may or may not embroil us unless we are patient and far-seeing — unless we analyze conditions and resources and act upon common sense judgment and not upon impulse or selfishness. Having won our war for freedom, do not let us sway to the bestial impulses which war engenders. This is no time for stubbornness or intolerance. What we need now, more than in any time in our history, is calm, unbiased, self-controlled judgment which will permit us to get our bearings and start the new era with reasonable security that the future will take care of itself as the readjustment grows apace.

The iron heel of war touched us but lightly here in the United States in comparison to its ravages in Europe. We have made our little sacrifices for war; my most earnest prayer is that we may be strong enough to make the sacrifices which we must make for peace. There is room for all of us; there is work for all of us to do; there is patriotic incentive to drive us to maintain in peace the pre-eminence we gained in war. We must not permit ourselves to be Russianized, or Germanized, or any other " ized." Let us continue to be just citizens of the United States.

Mr. Holland, you have a great task ahead of you. I think I appreciate the task ahead of me. You, Mr. President, as a member of a great Empire State Commission, and your fellow-commissioners, may be the determining factors in the State in this situation fraught with so many tremendous possibilities. All of us must be true to ourselves and our responsibilities, but, above all, we must unite and be true to that greater thing — the Republic.

This is safety, ladies and gentlemen, the greatest safety work of all, the preservation of our national self-respect. I wish I could impress upon all of you how necessary I feel it is to spread the doctrine of self-restraint, not only among employees and employers, but among all the rest of our people.

In conclusion I want to say (I have been looking over the program) that I believe this Congress is to be even more successful than the others that have gone before. All of us should carry home ideas that will benefit us. The Association I represent is keenly alive to the benefits of meetings such as this and I am authorized to say that the New York State Industrial Safety Congress, as long as it is conducted as it has been in the past, will have our heartiest support.

COMMISSIONER LYNCH: I think that all of us can agree in the main with everything that the previous speaker has said. I know that he is an entirely unprejudiced observer of this conflict between capital and labor. I join with him in the thought that the evidence of wisdom and sanity will lead this country out of a conflict of arms not into an industrial conflict but into a period of consultation and conciliation that will make for the benefit of the people in industry, and making for the benefit of the people in industry, representing the great percentage of the people in this country, will make for the benefit of the country itself.

I now have the pleasure of introducing the President of the New York State Federation of Labor, who, in his capacity, is entitled to speak for the wage-earners of the State and who will discuss the same subject that formed the topic of the paper read by Mr. Chase.

I now present to you Mr. James P. Holland.

WHAT ORGANIZED LABOR THINKS ABOUT THE YEAR'S ACHIEVEMENTS IN SAFETY WORK

BY JAMES P. HOLLAND, PRESIDENT, NEW YORK STATE FEDERATION OF LABOR

Ladies and Gentlemen: Again it is my privileges to bring to this Congress the greetings and well wishes of organized labor of New York State.

I am here by direction of the convention of the New York State Federation of Labor, held in Rochester during August, to say to you that we are already beginning to experience in our workshop life some of the benefits of the work and ideals of this Congress. The old era of indifference to accustomed hazards is fast passing away and in its place we see and feel the new spirit of protecting provision at work; and this notwithstanding abnormal conditions encountered by our workshop during the stress of war time production with green hands mixed into every group of mechanics and the day's work stretched out with vitally necessary overtime work. Now that we have completed our giant task and whipped industrial and war-mad Germany at her own game, we can confidently return to our ways of peace feeling sure that there is no job too big for America and her Empire State to tackle and finish.

One of the jobs that we of the State Federation of Labor believe you should assist in is that of making effective provision in this State for the retraining and refitting into our industrial life of the worker who has been injured in our workshops in such a way as to unfit him for the occupation at which he has acquired skill.

We want to make a place for that worker back among us. That it can be done the necessities of war have proven. Confronted across the Atlantic with a growing number of maimed soldiers unfitted by their honorable wounds for their former occupations, Great Britain and France have developed a system of retraining and refitting for industrial workers and our Federal Government has undertaken the same work here for our returning maimed heroes, using as its principal agency the new Federal Board of Vocational Education and its equipment.

The State Federation of Labor has decided that this human repair program should not be limited to its present field, but should be extended by State action to the maimed and wounded of industry and made a fixture in our educational functions. We have in this State a well developed system of vocational education, to which could be easily and without great cost added a department devoted chiefly to the type of education I am referring to. As our State system is associated with the Federal Vocational Board and, in fact, receives financial assistance and other valuable co-operation from that source, it would at once have access to all the information accumulated in the re-educating of soldiers so far, and, therefore, would start off accompanied by the light of actual knowledge. Its results would pay big dividends to the State and add greatly to the sum of human happiness and prosperity.

I am sure that if we can enlist the co-operation of this Congress in our endeavor to have the State inaugurate the work of restoring to the active work life of our commonwealth those whose misfortune has closed the way to independence in their former occupation, that such co-operation will bring the day of achievement decidedly nearer.

Without occupying any more of the limited time reserved for the other speakers at this afternoon session, I will await another opportunity to bring the subject I have briefly discussed to your attention for desirable action, and now take my seat with the other members of the Congress and profit, as I have on former occasions here, from the splendid instruction given from both platform and floor.

COMMISSIONER LYNCH: The next speaker was to have been Mr. William B. Wilson, Secretary of Labor. He is unable to come, as he announces in the following telegram:

> The meeting of Congress, preparation for the President's trip abroad and the pressure of re-adjustment problems has made a rush of public business that makes it impossible for me to be at the State Industrial Safety Congress in Syracuse next week. I regret my inability to be present and wish for you a most wonderful meeting.

As stated in that telegram, he could not come, and he has sent as his representative, speaking with full authority for him, Mr. Roland B. Mahany, Assistant to the Secretary of Labor, formerly Minister to Ecuador, and a former Congressman. I know him as a most eloquent and forceful talker, and while we would have appreciated the presence of the Secretary of Labor at this Industrial Safety Congress, I am sure that he has sent no mean substitute in the gentleman who will now talk to you. I have the pleasure of introducing to you Mr. Mahany.

THE GOVERNMENT AND THE LABOR SITUATION

BY ROLAND B. MAHANY, ASSISTANT TO THE U. S. SECRETARY OF LABOR

Mr. Chairman, Ladies and Gentlemen: It is always embarrassing to have to live up to an introduction. The preceding speakers have touched with such comprehensiveness upon the basic principles of the discussion in which you are interested that what is left for me reminds me somewhat of a story that Senator Hitchcock, Chairman of the Senate Foreign Relations Committee, recently told in a similar situation to that in which I now find myself. He said that in Europe they can always tell a traveler by the way he gets out of a train, that is, they can tell what his nationality is. When a train is coming into a depot, slows up and almost comes to a standstill, the man who grabs his belongings, throws open the door and jumps on the platform is an American. The man who gathers up his belongings in a careful and methodical way and steps out is an Englishman, and that other man who looks carefully around and takes everything that is left is a Scotchman.

I told that story because it is the affinity of my name as a sort of first cousin to one branch of the Gaelic race, so if there is any Scotchman here present, he will understand the cordial spirit in which the story is told.

I remember another occasion of a Harvard dinner in Rochester at which a Rochesterian graduate of Harvard read a humorous poem in which occurred the couplet:

"Oh, what's the use of Syracuse
Except to travel through?"

Now, Mr. Holland and myself, as outsiders, have discovered a new use for Syracuse, because, after listening to the very able and eloquent and patriotic addresses of Mr. Lynch and Mayor Stone and Mr. Chase, I, for one, and I am sure Mr. Holland agrees with me, feel that Syracuse is a city wherein patriotic citizens of the United States may stop off from their journeyings to take deep draughts of the well of freedom undefiled.

I have seldom listened to a more beautiful and thoughtful address than that delivered by your Mayor. He voiced ideals in which we should all agree, and the spirit exhibited by Mr. Chase shows a large intelligence on the part of those who have great enterprises under their control. Mr. Lynch needs no eulogy at my hands. His work over many a weary year is the best testimony to his usefulness not only as a citizen of Syracuse but of the State and of the nation as well.

It is a great honor to represent the Secretary of Labor, but it is a very especial honor to represent *this* Secretary of Labor. He is a man of broad, comprehensive and constructive statesmanship. His spirit is that of truth and justice and he has communicated those ideas, as far as it has been within his power to do so, to all the people who collaborate with him in this great department of the government which has under its control and within the purview of its jurisdiction so much of good for the upbuilding of the United States and for the progress and civilization of the future.

The thing you are interested in as delegates and visitors to a Safety Congress is not only the fact that the success of the idea you represent means benefit to humanity as well as commercial and industrial progress to the nation, but in a larger sense it typifies the idea which most of all we need at the present time, namely, the idea of co-operation.

It was a matter of information and illumination to me to-day, as I listened to the speeches of Mr. Lynch and Mr. Holland and Mr. Chase, that the idea of co-operation between the employers and the employees in the introduction and utilization of safety devices had become a success beyond all possible peradventure, not only from the standpoint of humanity but from the standpoint of finance. It is a regrettable fact that sometimes the latter is the more practical consideration, but a nation that has just borne a great and honorable part in the vindication of democratic ideas will lend itself with greater and greater enthusiasm to all ideas of this kind, which mean the success of the new era which will inaugurate a larger civilization in the nations of the world than the world has ever hitherto known.

I assume that in this assemblage there are many representatives of the manufacturing interests as there are many representatives of labor ideals and ideas, and it must be interesting to both sides. Perhaps it is also advisable at this time to touch upon a question that may clear up some misapprehensions on both sides as to the attitude of the United States Department of Labor. The purpose of that Department, so far as the administration of William B. Wilson is concerned, is to hold the balance true, to do justice to all and injustice to none, to prevent undue encroachments on either side, and thus to bring about that equilibrium and adjustment of relations that will lead each side to believe that in the Department of Labor and in the Government of the United States both can rely with implicit confidence that justice will prevail.

We are entering upon a period of reconstruction. I have no alarm, speaking personally, in regard to the result of that reconstruction. The manufacturers who for 142 years have built up this mighty commercial republic, which exceeds in its power and splendor the glories of every other government since the beginning of time, may be depended upon to take an intelligent, considerate and advisable position in regard to the problems that will arise in this period of reconstruction, and the labor element who for the same 142 years have given the best of all that was in them to the same upbuilding of the same republic, who have shed their blood and laid down their lives on every battle-field of every war in which this nation has been engaged, can also be trusted to take a patriotic and far-sighted view of the necessities of the situation.

The Department of Labor (I am addressing myself particularly to the manufacturing interests at this moment) has had a very great and arduous task to perform. It has done it quietly, unobtrusively and effectively. There has been no heraldry of its work. Had it not been for the efforts and agencies of this Department during the period in which we have been at war, (I speak without the slightest doubt that what I say is beyond the power of contradiction) the result at the present hour might be very different from the victorious and glorious fact that it is.

The very quietness with which the Department of Labor has proceeded has prevented it receiving that credit which is its due but for which it has entered no claim, and the only reason I mention it at this time is that those of you who have not had your attention directed to that fact may have this thought in your minds for further consideration, and that you may watch the verification of the truth of what I say as your larger acquaintance with the subject may afford you the opportunity of acquiring.

As between the two elements which hitherto have been regarded as contending forces, the Department of Labor has endeavored, as I said at the beginning of my address, to hold the balance true in a kindly, just and impartial fashion.

If we have unconsciously leaned to either side, we have, perhaps, without intention leaned in favor of those conditions in which the great industrial establishments of the United States might have prosperity and an absence of those conflicts which militate against prosperity, because we realize that without the constructive brains and genius of those who build up great enterprises there will be no employment from which labor may derive wages. So that while the Department of Labor by its title would seem to indicate that it was a partisan of labor, it has nevertheless been absolutely just; it is the defender of the wage workers; it was so intended by the organic law by which it was created, but it is the defender of the interests of labor upon the basis of indisputable justice. It stands for encroachment on neither side, and when the Department of Labor finds either side encroaching upon the rights of the other, its powerful arm is stretched forth to intervene and to prevent such encroachment, and the best testimony of the success of its work has been during the period of this war when it has maintained to a degree not appreciated, perhaps, by either of the elements to which I have referred, a continuity of production and a contentment, a reasonably adequate contentment, of both sides to the benefit of each and to the glory and to the success of our common country.

Ladies and gentlemen, there is another thought that occurs to my mind at this time. It is this: That we are entering upon a period of reconstruction of social, industrial and commercial conditions in the United States; we are entering upon a new era that is the beginning of a larger civilization, and while that is good for us and while it is to our benefit, to our special benefit as a government and a nation, in a larger sense these benefits will extend to all the peoples of the earth just as the foundation of liberty in the United

States in 1776 has resulted in the spread of democratic ideas in unexampled fashion at the present time throughout the world.

So if we enter this period of reconstruction without a spirit of small or narrow purpose or vision but with the largest human feeling in all directions, we will not only aid the reconstruction of the world but we will place our own liberties on a more enduring basis. It was that note in the speech of your Mayor that particularly attracted my attention, when he said that we will try to make liberty in the United States more of a reality than it has ever been, not so much liberty from the lips out but liberty that resides within the temple of the heart and the soul of this nation.

So in this larger spirit we can take a larger view not only of our own internal conditions but of our relations with the rest of the world.

I am glad, as a representative of the Department of Labor, to leave this thought with you. I look upon all humanity as a great mother and this earth of ours our home, so without vengeance, proud in the consciousness of our own strength, of our own integrity, and fortified by the splendor of the victory which we now possess, we can say, as was said at the close of the Civil War:

> " Fold up the banners, smelt the guns,
> Love rules, her gentler purpose runs,
> A mighty mother turns in tears,
> The pages of her battle years,
> Lamenting all her fallen sons."

Commissioner Lynch: My friends, this concludes the speaking program for this afternoon. Let me say at this time that all of the citizens of Syracuse are welcome to attend these sessions. I am sure we are very much obliged to you who have attended, and I am also sure that if you will attend the balance of the sessions during the week, you will be amply repaid by the papers that will be read and the discussions that will follow.

MONDAY EVENING, DECEMBER 2

PRESIDING OFFICER: MISS MARY DREIER, NEW YORK WOMEN'S TRADE UNION LEAGUE

MISS DREIER: In taking up the question of women in industry from the point of view of safety, it is very hard to differentiate between safety for men and for women. As a matter of fact, safety in factories and workshops is the same for women as for men, and if we were for a moment to take the larger aspect of safety and consider safety in industry as a means of attaining Democracy, I think it might be somewhat helpful.

Our men have been fighting for safety in the trenches in France. It makes safety for Democracy a fact in the world and we know that we must make safety in industry a fact for Democracy and that to attain real Democracy we must have it in industry as well as in our political life. We cannot hope to make the world safe for Democracy in any way at all without digging down into the very life, the industrial life, of the people. And so if we ask you for a moment to regard the question of women in industry not only from the standpoint of safety devices, but from low heels and overalls instead of skirts, caps to cover the hair, safety belts, etc., it might be helpful for all of us.

Women, since the war, have gone into any number of trades all over the world. Wherever you go you hear discussed what has been done by women in the war. The conversation invariably turns upon women in industry, it doesn't make any difference whether you go to a Y. W. C. A. meeting or a parlor meeting or any kind of conference. The discussion finally gets to what women's contribution has been in the war, what women have done in industry and how they have taken men's places and how they have gone into work which they were forbidden or prohibited from going into a little while ago, and how they have met the difficulties with as great an ease as was possible and with as little difficulty for the employers, so little difficulty that it was surprising to them.

Unfortunately, we have not the program to-night which we had originally planned. Miss Van Kleeck will come to-morrow and will be here to-morrow evening to talk to you about the work that she has been doing and the work that the Federal Government has been doing in relation to women in industry. Mr. Carpenter has again disappointed us. We had hoped that this time he would really come. He did not come last year. He had so genuine a contribution to make that we felt it was well worth while asking him again.

However, we have friends with us who will be able to discuss and will be glad to discuss with us the question of woman's contribution and woman's work through these last years and months.

We hope to throw open the conference for discussion before Mr. Vogt gives us the lantern slides. For the first speaker I am going to ask Dr. Patton, of the Bureau of Statistics and Information, to give us a very brief statement regarding women in industry.

WOMEN IN INDUSTRY

By Dr. Eugene B. Patton, Bureau of Statistics and Information, New York Industrial Commission

Madam Chairman, Ladies and Gentlemen: I suppose it should be regarded as a compliment always when one is asked to serve as a filler-in at the last moment. If I had a little more familiarity with public speaking, I should consider it as such, but having had so little, I regard it rather as a source of embarrassment. When I was asked to say something I said, "Well, if you will give me six months' time, I will try to make a speech," but it had to be done this evening or not at all.

What are women and what is industry? Women are approximately one-half of all the people in the world. That is, women are half the people who live on the earth, and industry is the sum total of the processes by which people get a living, so that when we consider women in industry, we must have in mind half the people in the world and the processes by which all the people, including these women, get that living. Now, if women are half the people there are in the world and if everybody that is in the world gets a living by industry in some form, is there any reason, can there be any reason given, why women shoud be denied their share in the productive processes of industry? Is there any reason why one set of people in the world whom, for the purpose of convenience, we will call men, should arrogate to themselves the peculiar province of industry, or why they should be allowed the privilege, or be saddled with the burden, of making their living and that of the other half of the people in the world as well? It seems to me that if a visitor from Mars had this question propounded to him he would say that he saw no reason why half the people in the world should live by the products of industry and have no share in that industry. While we are taught to regard labor as something of a burden or a curse, after all we all realize that the chance to work is the greatest blessing that comes to any one of us. There is no reason why women should be denied that. Up until comparatively recent times nobody ever thought of so doing. Within the memory of a good many of us, depending upon the locality where one has been brought up, women did take a complete share and participate extensively in the industrial life.

In the colonial times and reaching on down, as I say, into the memory of many people now living, women were not regarded as a part of the people set apart to be supported by human industry and live on the products made by men. They did their share and it was a share. The illustrations are too numerous to bring to your attention. It is true to-day to a much larger extent in Europe than in our own country.

Roughly speaking, we all know that, since the industrial revolution, industry has tended to become more and more a man-made industry. It was taken away from the home where it had been originally and where men and women had had a share equally. That condition has continued to exist and to become intensified practically ever since the industrial revolution. But with the coming of this last war we have heard a great deal about the entrance of women into industry. It isn't true at all that women have been re-entering industry since the war. They entered it long before that. I do know that, according to the 1913 edition of the Industrial Directory of New York State, out of 51,000 factories inspected in 1913, 30 per cent of all the shop employees were women and girls. I recall that according to the Federal census of 1910, taking all persons in the United States ten years of age and upward who were gainfully employed, to use the census expression, there were 21 per cent that were women.

The phenomenon which we are apt to easily think of as a new one, that of women entering industry because of the war, is not new, and it is very fortunate for us in this respect that we are not confronted with something new for which we have no background of experience to guide us. The factory inspectors of the State of New York, for example, have no new problem set before them. It is new in details and specific application, to be sure, but women in industry is not a new problem. We have long been accustomed to dealing with women in industry. It is true that men and women have taken up new jobs and new lines of work which they had not been engaged in before, but it seems to me that with the background of women in industry we in New York State have had for a long time, and with which the United States as a whole has had to deal for a long time, that we have something to start out with at the present when the pressure of the entrance of women in industry has been very much increased. We do have a working knowledge which is of very great help to us. So it seems to me that what we have to do is to build on the past, to recognize frankly that women are in industry and there to stay, not to become alarmed by it, to remember that women within the field of industry is no new thing, that they were in industry up until a century or so ago everywhere, that they have remained in industry in some places continuously, that they have been in industry in New York State in large enough numbers and for a long enough time to give us the means of approach to the situation.

I am sure many of you do have specific knowledge of a great many features and situations where the entrance of women in industry is new and on which you can give us a great deal of valuable light and information. Still, what I have to say this evening is by way of a general reminder that we are not speaking of something new when we speak of this question, we are not speaking of something alarming, that we are speaking of a phenomenon which has always existed to some extent and which is going to stay with us and be with us, in my judgment, to an increasing extent.

As I said at the beginning, if any man or woman here present can give any reason in the world why one-half of the people in the world should exist, should live from the products of industry of the other half, I'd be glad to hear you give it. I think men should not assume that privilege nor should they be saddled with that burden, whichever you choose to call it, nor should women be denied the privilege of being in industry or suffer the unfair discrimination of being supported by industry without effort on their own part.

MISS DREIER: During this last year women have entered certain industrial groups in very great numbers. Of course, munition plants have enormous numbers of women employed, as have also machine shops. We have with us the President of the Machinists' Union who is also President of the Central

Labor Union of Brooklyn. It gives me very great pleasure to introduce to you Mr. John Coughlin, who will speak of the women in his industry and give you some interesting information. Mr. Coughlin didn't know he was going to speak until late this evening, so he comes somewhat unprepared and not with the facts that he could have brought with him from home, but I know he has a great many in his head.

WOMEN IN INDUSTRY.

By Mr. John Coughlin, President, Central Labor Union, Brooklyn, N. Y.

Madam Chairman, Ladies and Gentlemen: When I got off the Empire this afternoon, one of my old inspector friends, or as we call them now, a safety engineer, said to me, "Wherever I see you at a conference, I know there's going to be trouble." When we got to the Onondaga we found there was trouble. The Women's meeting was without speakers. So they had to adopt the same means as our government when they were without soldiers and draft them.

What is this question of women in industry? The Chairman of the meeting said that there is very little difference in safety work between women and men. I am awfully sorry that Mr. Carpenter is not here this evening because I don't propose to take his place by any means. I couldn't if I did propose to do so. He is probably one of the greatest industrial organizers that this country has, both from a safety engineer's standpoint and from a humanitarian standpoint. He has done great work in breaking women into new fields, so I am going to try now not to talk so much about women in industry but what we might do from a safety engineer's standpoint, what might be done from a manufacturer's standpoint and what labor's part is, that is the organized workmen's part, in protecting not only the women but the men.

It is reasonable to suppose that we must discuss women. The Doctor told you that women are re-entering industry. That is hardly the best way to put it. I have known that in the large steel industrial centers where they made bolts, where they made barbed wire, where they made nails, women were working twenty years ago in some of the hardest kind of work. As they began to educate women in industry they found that hard work was not good for the real function that woman was put on earth to perform. We are suddenly dealing with the situation as to whether woman will go back to the home or whether she will stay in industry, and I want to say to you very frankly that woman will settle that for herself just the same as a man will.

The war suddenly stopped; we quit making munitions and we have got to change over to something else. How far are we going to permit women to enter industry or to stay in industry? It is a mistake to say that a woman can do some things as well as a man can. I believe that any man who is working for an insurance company and who handles the accident reports will tell you that where females in certain industries are placed alongside of males the accident frequency runs from 20 to 50% higher than it does with the males.

Mark you, I am talking as an insurance inspector myself and not as a labor man. I have heard from safety engineers in Canada in discussions that where women entered the industries in Canada in large numbers the accident frequency in some plants was 100% higher. Why is that? Of course, women's dress is different from men's. That is one thing. In the last one hundred years, and I am not saying this from close observation, we know that women more or less have a certain evident vanity, that is, they have outward signs. Men have the same thing, but they don't show it as much as women do. They like to have looking glasses around and fix their hair and do other things rather than keep their minds on their work after a certain period.

We know that the nervous condition of women is somewhat different from men. An inspector from the Aetna, who worked in this part of the State, was dealing with a stamping plant in Rochester and one particular stamping press had taken the fingers off of the left hand of four different operators — all females. It was guarded; they had a bamboo guard on it, but it always seemed that their hands would get under this particular stamping press. He observed it for a while and he noticed that the stamping press was facing a window right on the corner of a busy street. They shunted cars there and there happened to be a particularly good-looking young fellow who was switching the cars and the girls were paying more attention to him than to their work and, therefore, lost their fingers. You safety engineers who have anything to do with that kind of a case will know how to act. They simply turned the stamping press around so the girls could not look out the window.

We are apt to deal with the question of women and men from a manufacturer's standpoint as to wages. There are certain kinds of industries that women will fit in and where they can do equally as well as men. In other words, you can put them on a light lathe. You can put them on a sensitive drill press, but you wouldn't want a woman to run a big radial drill press or a 36-inch or 42-inch lathe, because it takes a superior quality of man to run those in order to get the best products. Manufacturers are often liable to say, when they are hiring women, that they can get women so much cheaper than men. The trade union movement says that if we are to build up the race, if we are to have democracy, we have got to have a well paid human race, well paid human beings. That is to say, if you are going to hire a woman and put her in a machine shop, you are going to pay her the same wages as you would pay a man if she can do similar work, in other words, that you are not going to use the woman in competition with the man, because when a woman is working for 15 cents an hour and her man is loafing around the house, she will be apt to be worried and be thinking about him and not do good work and you will probably not get the best results.

During the war period there have been women employed in the machine industry, that industry we have heard so much about where they get high wages for as low an hourly rate as 15 cents an hour. I know of one large plant in New York City that took women in their employ for 21 and 22 cents an hour. We say that is wrong, because you can't keep a woman well fed, you can't keep her in decent comfort if you only pay her that low rate of wages. In the transportation industry we believe that a woman would be better off in the home than pushing through crowded cars collecting fares. That is a job where it almost ruffles up a man, and I believe, now that the war is ended, while many women deserve a great deal of credit for taking up that kind of work and giving their services in order that we might be readily transported to and from different points in different localities, these women should return to some other congenial employment rather than pushing through street cars and butting up against the mob, so to speak, in order to earn a livelihood.

After all, this question, when we come to figure it all out, will be a matter of cooperation. It is a matter where the state must step in and perform its function. It is a matter in which the trade unions should carry on their campaigns of education and perform their functions, and I believe it is a matter of thought for the manufacturers themselves.

We have passed through this war, as some one said at the Council of National Defense, through a baptism of fire. We have all learned our part. We have a new vision and it will be up to us to attempt to put the spirit of that vision into effect. If we are going to take advantage of each other, if we are going to say that women shall be exploited, if we are going to say that she shall work long hours, if we are going to say that she shall work at night, we may temporarily profit by that, but, after all, civilization itself will be the one that will have to pay the price.

Our movement, the great labor movement of which we are happy to be a small part, says that it is wrong. We intend to maintain the standards, we intend to go back to the pre-war standards of good labor laws, better legislation, greater restrictions where it is necessary in order to prevent the one who might take advantage from doing so.

I regret very much that I haven't had time to prepare something a little more extended. I believe that we have performed just our part in filling in. If there are any questions to be asked and we can answer them, we will be glad to do it. If we can't, we will very politely evade them.

I am glad to have been here. I came up as a visitor, more to look on, more to learn. I believe these Safety Congresses, from what little we have seen of them this afternoon, have that great get-together spirit in them. We have men here who are employers, we have factory inspectors both state and private and we have labor representatives from all over this State. It is an excellent thing that we should mix together and get each other's point of view. I know that when we have ended this conference we will have all been benefited by it. I feel greatly honored in being able to even fill in as I did.

GENERAL DISCUSSION

MISS DREIER: I wonder if there aren't any questions you would like to ask Mr. Coughlin or Dr. Patton, or any point of view you wish to present yourselves for discussion here this evening.

MR. PETER CONNELLY, Safety Inspector, State Insurance Fund: I was very much impressed with Mr. Coughlin's statement regarding women entering industry in the rolling mills and the bolt making establishments twenty years ago. I think that that was an extraordinary phenomenon at that time, but today we are confronted with the women entering industry and refusing to get out.

The dearth of men has caused the manufacturers to look to women to fill the gaps in the manufacturing plants of this country, and we find them doing it. Having done it and having once tasted the pleasures of high wages, they are not going to go back to the stores for $8.00 or $9.00 a week.

Saturday I was in a place where they are making shells for the United States Government, and I saw there women working alongside of men on the big lathes. You would see a man and then a woman, a man and then a woman, both performing the same work. There were women working on the radial drills such as Mr. Coughlin said they hadn't worked on yet. I don't know whether they have put them on the larger lathes yet or not.

While I was in that plant I asked this question, " What is woman's status as to efficiency as compared to man's? " And the man of whom I asked that said that her efficiency is much greater than that of the man. I said, " What are you going to do when the men come back from war and you can get all the men you want? Will you retain the women? " He said, " Yes, as many as we can; as many as are willing to stay here." I said, " How do you pay them as compared to men? " He said, " Well, of course women don't ask as much as men." I said, " They both are performing the same work. You say women are more efficient than men. Why don't you pay them the same wages? " He said, " They haven't demanded it. It is up to them to demand it." I said, " Don't you believe that if a woman can perform as much work as a man can perform that she is entitled to as much wages? " And he said, " Yes." Then he said, " I suppose they will get it because anything they go after they get."

Now we have this problem before us. Women are in the manufacturing field and they are not going to get out. Last year we had a man speak from this platform who told us that the women had gotten into a certain industry in this town and that they were paying them just as much as they paid the men, but we found on analysis that they weren't paying them as much as the men because the women were doing from one-third to one-half more work than the men for the same wages and, therefore, weren't being paid as much.

We have this condition confronting us and we have to meet it by making women demand as much wages as the men are getting if they are going to continue in the same industry, and I don't think that they will leave it. I am very much in favor of giving women just as much as the men are getting. I see women in all fields of industry. I see them in professional lines, I see them as stenographers, I see them as clerks, I see them everywhere, but I find they are all underpaid. Why? Because women have allowed themselves to be exploited in the past.

I think the thing for women to do is to organize and to demand wages equivalent to the wages that men are getting, and in that way we can solve this problem of women cutting down the men's wages. Women have competed against men, children have competed against men. We are getting rid of the child labor problem, but now we have the woman problem to confront us, and the only solution is to organize women and educate them to demand the same wages that a man is getting.

MR. COUGHLIN: I don't know that you get my point. The point I tried to bring out was that a woman runs a 36-inch lathe, she runs a radial drill press, but we must keep in mind woman's mission on earth. If you say that a woman ought to have seats in the department stores, that she can't, because of a physical consideration, stand on her feet over ten hours, why put her in an elevator running it without a seat? Why make her bend over a 36-inch lathe when it breaks a man's back to run it? Conditions don't change simply because we have had a war. The woman still remains the unit, and if you forget her proper function, civilization must pay in the end. That is the point I am trying to make. Equal pay, of course, will remove the woman from the field. I think I have inspected almost every factory in New York State, and I question whether a woman can turn out the same amount of material in a given time on a given machine as a man who is in a good, healthy condition. Of course, he might have been out all night, and pitted against a woman who has stayed at home and had her night's sleep, he might not do any better; he may even fall down two or three points on that, but the next day when he comes back the pile of shells, or whatever material he is working on, will show a healthy balance.

Mr. Connelly: May I say that I do grasp Mr. Coughlin's point of view? I believe that not only should the woman in the elevator have a seat but also the man. And after July 1 we will have the question of the man standing or hanging over a bar all night settled once for all.

I said that the manufacturers themselves say that women turn out more work than the men, but they don't get the same money. If women are going to continue in industry, they should get the same wages men are getting. That is the only point I wish to make.

Miss Dreier: There surely can't be any dissension on that here. I wonder if there is.

Mr. L. A. Havens, Chief Factory Inspector, State Industrial Commission: I refer back to the old Bible statement that woman was put on earth to be a man's helpmeet and not his competitor. I believe the man should receive enough and be able to earn enough money to support them both. I may be extremely old-fashioned, but I am on the contrary side of the question to that extent.

Miss Dreier: I think there must be somebody here who will take the opposite side of that point of view and explain how very satisfactory it is for women to have economic independence.

Mr. C. H. Norton, Norton Grinding Company, Worcester, Massachusetts: I am not going to take any opposite side particularly.

In the state of Massachusetts where I live we are employing women in machine shops. We manufacture machine tools. Some of those women can do certain work equal to men. Some of them can do more work than some men, but we have not got them by the training department yet. There has not been time. We have a large training department. We have men, women, boys and girls in that training department, and the first minute they come to work when they know nothing at all they are paid 31 cents an hour, which seems, of course, to the old line worker as not very much. I haven't any doubt but what women will stay in industry, and I haven't any doubt but women will do as well as men and be paid as much as men. It has got to come like all things come, like changes come; we never will live in a time when there are no changes; we never will see a time when there will not be some one who tries to get around those changes, but they come in the end just the same no matter what is done against them.

I do not believe, as this gentleman says, that all women can do what all men can, no more than all men can do like all other men. Some men can do well in one line, others in another. It will always be so and it will be so with women. We couldn't expect a woman, of course, to lift the things that a strong, muscular man can lift. Let us be sensible about these things and not expect woman to do everything any more than we expect man to do everything. All men and all women are not alike. We are paying women in the training department just as much as we are paying men whether they are equal to men or not. When they are out of the training department, then the time will come for them to demonstrate whether they are worth more than certain men. If they are, they will get more.

DR. PATTON: I think this ought to be borne in mind: We are talking about women being scheduled to run heavy drill presses. Industry as we now know it, as I said at the beginning, is largely man made. The machines have been made by men for men to run. But the head of one of the great plants in Great Britain that makes warships said a few months ago, "If this war lasts twelve months longer, we will turn out in this plant a first-class British battleship made by women from top to bottom, hull and all."

In order to do that you don't have to have the machinery to be operated by women, big and heavy any more than the general run of machinery operated by Japanese laborers in Japan is heavy. It is not the same style and type as in this country. I don't want to go to the extreme, but it is perfectly possible for the general run of industry to be operated by women. What this gentleman said is perfectly true in one way. We want to bear in mind that nothing is true of all men and all women in all cases. The line of distinction does not run along the line of sex only. The division of labor that makes it impossible for some men to do a certain job also makes it impossible for some women to do a certain job,— some women; but the division of labor that makes it unwise or impractical for some men and some women to do a certain job doesn't make it unwise or impractical for other men or other women to do a certain job.

MRS. JANE O. GANOUNG, U. S. Employment Service, Olean, New York: I have seen women work on the radial drill presses; I have seen them work on the lathes. It was my business to know whether those lathes and those drill presses were injuring the health of my women. I found there was one drill press about which the men said there was no darned reason why the women could not work on that drill press. They said, "They are just lazy." Now, the woman working on that drill press was so lazy — so blooming lazy that she was taking care of four children by working all day because her husband couldn't support them, and she supported them on $2.10 a day. She said it was not that the drill press was too heavy. She didn't get tired because of that, but she found that in turning a certain lever there was a pelvic strain from throwing her weight against that machine. She could not run the machine any longer. I put another woman on it and showed her how to run that machine without tearing herself apart and she ran it all right.

There was another machine that the men complained about, the women complained about, and it was constantly out of commission; it was breaking down continually. I found that by building a platform four inches high and raising the woman using it she could work right along and the machine wouldn't break down.

I found there was one bolt centering machine that the women worked on which made them awfully tired, so desperately tired at night. It was a simple process to put little holes in the ends of those bolts — all you men know about it, and the women wouldn't know if I told them because I can't talk about it intelligently and I don't know the names of the things. That machine made the women all so tired. I watched the work and I knew something was decidedly wrong. I picked out one woman who only weighed 110 pounds and I said, "Now, I want you to go on this machine and I want you to find out why you get tired." She said, "I can't go on that machine because I get four cents less on the hour. I'll tell you, my mother and my father are sick and my sister and I are supporting them and keeping our payments up on a home. We pay $25.00 a month and we would lose it if we didn't keep up the payments."

I said, "Every time there is a war everybody has to sacrifice something. It's up to you to go to work on that machine." She said, "All right, I suppose I'll have to," and she did. She didn't have to but she did it. After she went to work on it she said, "If you will have that handle lengthened about so much," that's a woman's way of measuring a thing; you fellows say so many inches, "it will be all right." I went to the foreman and said, "I want the handle on that bolt centering machine changed." He looked at me as much as to say, "What do you know about it?" I said, "Will you have that done this afternoon?" He said, "Yes." He had it done and we have never had one particle of trouble with the smallest girls running our bolt centering machine.

You have got to be everlastingly and all the time on the alert. If a belt shifter is four inches too short here or even two inches too short, the constant strain will hurt the operator. If a woman has a constant twist at the waist, she will be torn apart in no time. You must have somebody watching them, because if a woman is supporting fatherless children, she is not going to tell the boss for fear she will lose that job.

To my mind there is one thing which is the abomination of mankind and that thing is piece work.

Mr. Patrick Shea, Factory Inspector, State Industrial Commission: Madam Chairman, I am inspecting in a town where there are some few women in industry and it isn't a new proposition. I was in a cigar store about two months ago when a man there had been reading a New York paper and he saw an account of a meeting in New York of very prominent women discussing the new question of women in industry, and he said, "How provincial those New York City people must be!"

The question of women in industry is not a new one. It is true that since the war began women have entered into new industries. Those who have discussed the question have discussed it almost entirely from the standpoint of machine shops. A year ago machinists were a drug on the market. For the past year they couldn't be had, so the employers have brought women into that industry. There are many industries women have entered and will remain in, the textile industry in particular.

The fact that women have been introduced into industries or operations in which they were not formerly engaged has some basic reason, and I am of the opinion that if one carefully investigates, it can be traced to a certain cause. The industries in which women have been largely engaged for years have not advanced in wages as have industries in which men were principally engaged. I have an idea that I know the reason for that. I may be wrong. So far as I know in those industries where men and women do the same work and it is piece work, they get the same pay. Perhaps that would not apply where men and women were doing the same work and paid by the hour or day, but the fact remains that the wages of those industries in which women are more largely employed have not advanced in proportion to the advances made by men. I think that can be traced to a lack of organization generally among women as compared to the more thorough manner in which men have become organized.

I don't believe that the average manufacturer is in business for his health. I believe he is in business for profit. He has his money invested and he is going to take as much out of his investments as he possibly can. If he can secure help for lower wages, he is not going to pay the higher wages. I think it is up to women to take care of their own affairs.

I used to be an organizer, but I am not any more. In one industry in which women are largely engaged the wages have decreased very much in twenty years rather than advanced. As the women became proficient and learned to work faster the wages were cut. At the present time they turn out probably twice as much as they did twenty years ago, but they are not earning 75% as much wages as they did twenty years ago. That couldn't possibly happen in industries in which men are engaged. Even if they weren't organized the very fact that reductions were taking place would cause them to organize.

I inspected a factory a few weeks ago, a plant making shells for the Government. The plant was equipped since the war. They had about thirty women working there and about two hundred men. The women were engaged in work that was suitable for them, it is true. They were inspecting, they were not running machines, but they were working eleven hours a day and eleven hours a night, which was violation of law. I told the man so and asked him why it was. He said that he had selected the women for the work of inspecting because they made better inspectors and were more adaptable to the work than men were. I believed it and I still believe it is true, but I think there is a little method in his madness because upon investigation I found that the women were getting 25 cents an hour for inspecting and the women ranged from seventeen years old to over thirty, as they say on election day.

I found that the youngest man working in the place was a boy just past sixteen. The lowest wages paid the men were 35 cents an hour and the women working there were only getting 25 cents an hour, but they were more competent inspectors than the men could possibly make.

The fact that there are certain industries in which women are engaged now to which they are not at all suited is the only thing which should cause any serious worry, because as things get back to normal and we have a re-adjustment and there are plenty of men, the women will probably leave the industries to which they are not suited and will go back to the industries they have always been engaged in. Women have been and always will remain in industry. The remedy is in the hands of the women themselves. I don't think that anybody is going to deprive them of earning a livelihood if they want to.

One gentleman spoke of transportation. I personally believe that the corporation or the man who has attempted to and has employed women as conductors on trolley cars was committing a crime. If it had been in Germany, he would have been called a Hun. Women are not going to remain in that when things get back to normal. The question of women getting out of industry is simply hysteria. They have always been in industry and they always will be, but the remedy for the conditions that exist is in the hands of the women themselves.

MISS DREIER: Is there any one else who wants to say something on this subject?

MR. M. SIEGEL, Factory Inspector, New York City: Down in New York City, particularly in the needle industry, I found during the last eight or ten months a great number of colored girls working in the cloak and suit line, dress and waist line, as finishers. I called the attention of one of the employers to the fact that it was surprising to see so many colored girls in that industry because before that it was entirely confined to the white girls. I said to him, " I think the colored girl is coming into her own now." He said, " If we had our way, we would have taken those girls in five years ago, but it seemed the white girls didn't care to work alongside of them in the shops." I said, " How do you find it now? " He said, " The more girls I can get, the less wages they will work for," so I believe that what Inspector Shea has just said is true,— there is method in the madness of the employer.

MISS DREIER: That has been the great tragedy of woman's entrance into industry — she has had to go in not because she wanted to, but because she was forced to by circumstances and the only way she could get the position was to underbid the man, and her brother had not always the desire to take her into his organization and help her; he didn't want her, and the woman, believing that she was only in industry for a very short time, and considering her place in industry simply from the personal point of view instead of from the large social point of view, didn't realize that by staying in a few years only, as she expected to do, and by underbidding men and getting lower wages than men that she was doing a permanent injury to the workers of the country. The same thing now holds true of the colored girls. They are coming in; they have a chance to get in and they are being used by unscrupulous employers to break down wages, just exactly as women have been and still are doing — being used to break down the wages that men have after long and hard efforts attained.

It has been said here tonight and it is being said in other places that this war has taught us a great thing, at least, in giving us the sense of our service to the state as citizens of a great Democracy. Now what we must do is to utilize this purpose for service to our state in changing industrial conditions and making them such that every man and woman who wants to work shall have a chance to work, and for wages upon which it is possible to live.

I was surprised and amazed to find that the War Industries Board decided that 72 cents an hour was the lowest wage, the minimum wage, upon which a man could support his wife and three children,— and who gets 72 cents an hour? How many of our industries, how many of our well organized industries, pay 72 cents an hour? The only way it could be done in this time of war was to allow time and a half for overtime so that the minimum for regular work on a basic eight-hour work day was 42 and 45 cents an hour. The men made enough on overtime to make up the difference, and now we have cut out overtime. The Federal Government has cut down overtime and we are to live on an eight-hour day.

I ask you men to consider this part of it. It is going to be a tremendous problem with which we have to contend. Nobody is going to be satisfied. The men coming back from Europe, having fought for their country, will not be satisfied with wages upon which they can't support their families. They will under no circumstances be satisfied with that, nor will the men and women here be satisfied with that. More than owing anything to themselves or anything to their families they owe to their state a kind of society upon which a real Democracy can be based, and that is the society upon which men and women can live in decency and intelligence and become free citizens of a free Democracy. We are not going to fall down behind other free nations; we are going to hold up our heads; we must look into our own homes, our own hearts and our own industrial problems and see that we are on the square ourselves and the people who work in these industries and with our state and country.

For the rest of the evening Mr. Vogt, Chief of the Bureau of Industrial Hygiene, will give us lantern slides on particular things affecting safety. It is going to be very interesting and Mr. Vogt will be glad to answer any questions.

SANITARY DEVICES FOR THE REMOVAL OF DUSTS, FUMES AND GASES, ILLUSTRATED WITH LANTERN SLIDES

BY MR. JOHN H. VOGT, CHEMICAL ENGINEER, NEW YORK INDUSTRIAL COMMISSION

Madam Chairman, Ladies and Gentlemen: It has been said that this is an age of science and ours a nation of science. The advance in sanitation is an index of the progress of modern civilization. Sanitation with all of its wealth of scientific achievements, with all its learned and earnest workers would never have made such great progress, without the aid of an aroused public sentiment.

When many men, thinking independently, come to the same conclusion action naturally follows, and when men so thinking demand facts and carefully weigh the evidence, there is likely to be action along the right lines.

Education or advancement in knowledge is, therefore, the force of our civilization; it has broken many follies of superstition and ignorance and will break many more.

The formation of organizations like this assemblage, seeking knowledge to change if necessary the old order of things with particular reference to accident prevention in factory and mercantile establishments, is a direct result of individual thought, and its effect along proper lines will naturally be far-reaching.

The prevention of an accident is not all in which both the manufacturer and employees should be interested for there is no more important subject before the industrial world today than that of hygiene of occupations or, in other words, prevention of vocational diseases. There were reported by physicians, in compliance with Section 65 of the Labor Law, and found by our medical inspectors attached to the Bureau of Industrial Hygiene, of the Industrial Commission, 377 cases of trade diseases in New York State in factories for the fiscal year ending June 30, 1917, and more than 500 for the year ending June 30, 1918, some of which were directly traceable to inhalation of fumes and gases.

Health is the principal asset of the working man and any impairment of this asset is of as much importance as the cutting off of a finger by a saw or the loss of an arm or leg resulting in serious consequences with all its painful attributes.

Many factory proprietors have realized that good health of the employees is necessary to success and that any impairment of the health of these workers results in a decrease of efficient work. While individual work naturally progresses along this direction, legislative bodies were alive to the fact that to compel action along such lines, the enactment of specific laws were necessary. Of the Labor Law, Sections 81 and 88 relating to ventilation, also rules 131, 133, 135, 556, 160, 700, 718, 719, 721 and many others of the Industrial Code relating to removal of dusts, fumes, gases, vapors and heated air not only require the removal of these, but enumerate long lists of poisonous substances and state how they shall be removed.

Few men, no matter how strong they may appear, can effectively work in an atmosphere contaminated with dust, fumes, vapors or gases. Such persons are many times observed to be sleepy, to have a cold and take days off with the result that work is not turned out in as speedy a time as it should be and often is of an inferior quality which, therefore, is a loss to the manufacturer. The effects of these gases, fumes and dusts are, in many cases, deleterious on the building itself.

I have in mind a factory in Brooklyn, in which I personally pointed out the danger of nitric acid fumes on the wooden construction of the building. Three days after my visit the building burned from an unknown cause, possibly the result of the acid action on the wood, in which nitro-cellulose, a very inflammable product, had formed with the wood by the contact with the acid fumes.

When a factory proprietor in a certain city was ordered to place hoods over acid vats, he said it could not be done because the lead pans containing the acid and tar had to be replaced at intervals of two or three months. The roof of the building had to be renewed every two years, owing to the injurious effects of the fumes on the steel portion of the roof. When it was pointed out of what material the hoods could be built to resist the acid action and by their installation the life of the roof of the building extended, no objection was made to installing the devices. A compliance of the order has recently been obtained.

Again in textile mills, cotton lying on the floor of carding rooms and winding rooms can be effectively picked up by a vacuum sweeper. Once tracked about and soiled, its value instantly falls to a few cents per pound.

Not only is the sweeping of floors by vacuum method essential in many trades to keep stock clean by the conservation of products of a costly nature such as bronze powder and certain valuable or poisonous chemical products, but it is known that the material gathered up in this manner, in addition to being a far more sanitary method than to sweep the floors, becomes an actual asset instead of a loss.

Scientific tests conducted by the Division of Industrial Hygiene in a factory in Brooklyn, which was engaged in the manufacture of colors and pigments, revealed a loss of 30 tons of material per year. This material in the form of dust escaped from the mills, bolters and packers into the air of the workrooms and was valued as finished product at 15 cents per pound; one-third of this powdered material escaped through open windows and doors and was tracked into the street on the shoes and clothing of the employees. Had devices been provided at or near the mills and packers, this material would have been recovered.

In another case, after recommendations had been complied with to install a separator in connection with an exhaust system, a barrel of material was recovered every week in the collector of the exhaust system, which, prior to the installation of the device, fell on neighboring roofs, window sills and in yards, constituting a nuisance; some also re-entered the work-room through open windows. Although the value of the material intercepted in the dust collector was but one cent a pound, its collection resulted in a cleaner factory in that the discharged dust did not again enter the work-room and a satisfactory condition to the neighborhool was established.

"Industrial dust," states Sir Thomas Oliver, "is the greatest curse to the human race." It is largely of an inorganic nature, that is, mineral nature, but the atmosphere where the work is carried on is often also contaminated with fibre and microorganisms equally as dangerous as mineral dust, and all prominent authors on hygiene unanimously agree that continued work in a dusty atmosphere reduces vitality, and that the amount of dust should be reduced to a minimum as far as practicable.

While the Labor Law specifies that hoods, exhaust systems, aspirating flues, fans, and the like shall be provided to remove such dust, fumes, vapors or gases, the corporation or individual to whom an order is issued is often at a loss to know just how to go about it and provide the most effective device. It is *he* who must lay out the money, naturally he should get the most return for it, not 10 to 50 per cent, or any other fraction thereof, but 100 per cent for his investment.

Often he goes to a tinsmith, not to a ventilating firm or engineer; he contracts for a job without informing the labor department of his move; sometimes he gets a good piece of work, occasionally a poor one. At times these devices are passed by inspectors and sometimes questioned. But is the company or individual always satisfied? I can safely say "No." A recent installation of an elaborate ventilating system in a factory near the city of

Poughkeepsie was placed in such a location that the outlets were near windows, the intention being to change the air of the work-room three or four times hourly. It is easy to imagine this was not accomplished. Another recently observed in Staten Island with main pipes leading from large hoods to convey dust from weighing machines had to be taken apart every four weeks to remove dust accumulations in it as the mains filled up in that time. Never did it occur to the superintendent or management that clean-out slides would have solved the problem, whereby the accumulated material could be removed. Fifteen hundred pounds of dust was removed each time it was disconnected and cleaned which required the labor of four men one-half day, usually on Sundays, at double pay.

Upward movement of air exhaust is often installed, where fumes and vapors, heavier than air, require downward suction. Often it is found men are obliged to stand beneath hoods whereas in other instances, lateral exhausts drawing the fumes away from the worker should have been provided.

The matter is simply one of common sense and a problem in which the Industrial Commission will cheerfully aid to bring about the best results and save firms having such problems considerable money by cooperating.

All the pictures which I have to show you this evening have been taken in New York State by the photographer, an inspector of the Labor Department. They have been taken under difficulties, as you can imagine. Light being poor, vibration being such as it is under certain circumstances, many photographs are difficult to take.

About two years ago a certain firm in the State of New York requested the Labor Department for assistance to try and solve a problem of lead poisoning which occurred in their factory. Fortunately, or unfortunately, I don't know which, I was asked to go on the matter.

The man worked in a machine shop over at this point here. He had lead poisoning. The case was diagnosed by three physicians in that city and they didn't know where he got it. Through the process of elimination, it was found that he did not handle any lead at any time. For your information, these two Babbitt metal pots here contained lead. Above the metal parts is a hood, as required by the State Labor Department. To show that this hood is defective it is too flat. A pipe leading from this hood ran up to the roof but could not carry away the fumes. The fumes were wafted across and the chemical tests of the wall dust determined the fact that one-half per cent lead was found in the wall dust. After this hood was removed, it was requested by the Labor Department to place proper hoods over this Babbitt metal pot. The hoods are arranged in such a manner that they can be raised or lowered.

A test was made, 900 linear feet of air being expelled by natural aspiration from the heated air which emanated from these metal pots. To show the necessity of providing hoods in accordance with the law, you see here a tube of dust which is wall dust removed from the beams and rafters above a stereotype metal pot, and this small tube here is the amount of lead in the form of sulphate which was recovered from a similar amount of dust. You can see that 6.8 grams of sulphate of lead was obtained from 19 grams of ceiling dust, showing the necessity of having hoods over the metal pots, from which the dross is thrown off, that is, the dust which is composed of a mixture of the different oxides of lead.

The removal of fumes from paint spraying has become a necessity. The method of applying paint by spray is taking the place of the old brush method.

You see here two hoods and the spray brush, with the article to be coated, with the spray placed underneath. The man applies the spray on the article and this fan, of which the blades are removable, will carry away any excess spray, in other words, the spray is applied away from where the man is standing.

QUESTION: May I ask why you don't guard those fan blades?

MR. VOGT: They are probably five or six feet away from the operator. Of course, if the man deliberately places his hand in there, he is apt to get it caught. They could be guarded, of course, but it might arrest, unless it were removable, the accumulation of the material or paint being sprayed which would, no doubt, clog it up very, very quickly. I think that is a point which it is well to bring out in the future, because those fan blades revolve at a velocity of something like sixty revolutions a minute.

There is a larger hood in which there are two fans for removing the excess spray. They are very effective, far more so than the old method. In the old method the spray hits the back end of the hood and recoils very often into the man's face. By one of the old devices the spray had to turn almost at a right angle, go up into the air, turn another right angle and turn still another right angle to be removed by a fan or some suction movement. The effect, of course, was almost nil, yet the person who put in that device spent considerable money and got something that was absolutely ineffective.

That is the reason I ask that the manufacturers file plans in duplicate with the State Labor Department. Then they will get the experience of the engineers of the Department and get 100 per cent efficiency for the money they spend.

This picture is taken, and, by the way, it was accepted by the New York City Board of Health, as a means for removing dust from a table in beating furs. This is taking a knock at the person who installed the device. Here is a hood which is four feet square. Emanating from the top of the hood is a little two-inch pipe. Notice that it takes two turns, then a third turn down at the bottom, here is a little bit of a fan eight inches in diameter from which the dust, supposedly passing through the fan, is discharged into a garbage bucket. That garbage bucket had a flat-iron on the top of it to be sure that no dust could come out of the garbage can.

This is a device used for the beating of furs in which the man stands in front and pulls at either side the fur to be beaten. Here are three little sticks which operate automatically. Notice here the rheostat and the switch for turning on the current. The hood can be drawn down. In the picture, it is raised for the purpose of showing these little beaters. At the other end is a fan which pulls away the dust and after passing it through a bag of small mesh, discharges it on the surface of water. The water is kept in slight agitation and the surface is always in such a condition that the dust falling on it can be more readily absorbed. It is a new device that is just on the market, although there are a number installed in New York City where the fur industry of the State is principally located.

Rule 177 of the Industrial Code provides that floors shall be swept in such a manner as to create the least amount of dust, although it doesn't say that a vacuum system shall be provided.

You will notice here a system for vacuum sweeping of the floor. This is a factory in Rochester in which you see the bronzing machines. The wages of the man who operated this bronzing machine were more than paid for by the amount of bronze powder taken up by the system of sweeping, insuring a clean factory and well satisfied men. They recovered 90 per cent of the bronze powder which, as you know, contains lead in many instances.

The sweeping of floors by means of a vacuum system in picking up large chunks of cotton may be readily performed by the Fürth system of vacuum sweeping. The largest piece of cotton can be readily picked up and when the machine is full the clean cotton is repicked and put through the cards. There is a device on the side, which, under slight pressure, can blow the cotton from underneath the machines into the next alley. Then, the machine is run through that alley and it picks up the cotton there. It will take up a piece as big as a cocoanut and keep the factory clean in that way.

Here is still another device for the removal of dust in the sweeping of floors. These are usually about six or seven inches in diameter with a static suction of one and one-half inches sufficient to pull up almost any dust which is on the floor, except, of course, nails.

Woodworking machinery should require a little higher velocity. Note the half-inch by two-inch flat band which protects the pipe from injury in wheeling about trucks so that it is not smashed.

In a Paris green factory in New York City the manufacturer spent $700 on the installation of this ventilating device. He went to work and without consulting the Labor Department put up this device. These hoods are three feet above the table. Paris green is a heavy powder and has a tendency to fall and you could have a velocity of air there of 10,000 feet per minute and it wouldn't raise the dust, making the system not even 10 per cent efficient. If they had a downward system of ventilation with the ventilating devices underneath the table, they would have been able to recover 90 per cent of the material dropped on the floor, tracked about over the neighborhood and which got into the men's clothing and proved an undesirable condition, and which brought about quite a little arsenical poisoning in that factory. The condition, of course, has been remedied, but at the cost of the employer.

What I am trying to bring out is the necessity for cooperation. The necessity of removing fumes or gases by means of lateral suction when hoods cannot be placed overhead is to be considered.

In this particular case, these are pickling vats in which there is about a five to seven per cent solution of hot sulphuric acid and water. They cannot have hoods overhead so they have to resort to lateral ventilation. There is a hood at the back of the tanks into which the material is drawn, taking it away from the men and not into their faces. These, by the way, are steel hoods and steel mains, but they are lined on the inside with metallic lead for the reason that lead resists the action of sulphuric acid for some time in dilute form.

In the manufacture of thermometers a certain type of hood is best adapted to the work. These are wooden hoods with sliding glass doors. The man can see exactly what is going on inside. His hands are placed through these little holes. Each individual hood is connected with a pipe. The pipe is about one-sixteenth the area of the sectional area of the hood. Notice that each one has a damper. Also notice the manner in which the branch pipes enter the main and how the main becomes larger and larger as it receives the branch pipes. Good engineering practice requires that this be done. Many manufacturers, in putting up things of this kind, allow these pipes to run in at right angles. Instead of rounding elbows they have square elbows, reducing the friction, and, as you know, the loss in friction is equal to about ten diameters of the pipe; in a 100 foot pipe the suction is lost and you have to speed up the fan much more, and speeding up the fan means burning coal and costing money.

This is the best type of hood which can be provided above vats in which fumes, vapors or gases are free. It is almost impossible to use a hood four or five feet in diameter that will effectively remove the steam vapors or gases being discharged from vats.

Notice the manner in which these pipes enter the main at an angle of about 45 degrees. These are suspended from the ceiling. The whole thing can be lowered, if necessary.

It sometimes happens that in heated spelter or zinc the zinc fumes rise, and some manufacturers have said that it is impossible to have a hood large enough to effectively remove zinc fumes. Of course, the heating point, or melting point of zinc is high and the natural aspiration by means of heated air is quite great so that, when the hoods are properly made, the material is readily taken away by natural means, but, of course, it is not well to rely alone on natural means; fans should be provided in order to give the required static suction. Here the double hood comes into play. It is far more effective, although it costs a little more in the first installation that the giant hood having the large cross-sectional area.

The next is a great hood made of wood in which the inner section has another trunk line with openings at various intervals of about every two feet. It cannot be seen, I believe, from where you are, but the idea is that the hood is simply nothing more than a large pipe in which the material is gathered. You can readily see if they had four or five fans it would be impossible to effectively remove steam or vapor or sulphuric acid, or whatever it may be, without having an inner trunk line underneath this hood to take it away effectively. Wooden hoods are very often best, put together by means of dowels or wooden screws. People often say hoods fall apart if they are nailed. We recommend the wooden light screws in preference to copper or iron screws or nails.

The Cook system of stripping cards is coming into use now. Most of the large mills have replaced the method of hand-stripping the cards by the vacuum system. This is a particular device which costs quite a little money, but the entire machine can be kept clean by the suction method. This is a picture of the same machine, the device being attached to the cylinder in stripping the cylinder. At various points in front of each machine, there is a pipe about an inch and a half or two inches in diameter, placed near the machine, and all it is necessary to do is to attach the hose to it and the machine can be cleaned. The people in the factory in which this picture was taken did not know that we were coming, but that was the condition of the floor after the machine had been running all morning, so you can see how effective the device is.

I understand that in England and Belgium it is against the law to strip a card by hand. It often happens that hoods in removing heated air reflect considerable heat back into the operator's face. In this picture you see body irons in a laundry, and you will note these hoods are covered with asbestos covers which, being non-diathermanous, keep the heat in and don't let it radiate to the worker.

The next pictures show a modern hood over a mangle. Notice the gears are all well protected. We must assume the device is here placed so the operators cannot get their fingers in the roller. The operator can see what is going on on both sides of the mangle. There is glass on the side, and very little heat can get out of the machine which comes off from the roller.

In baking processes, for instance in plaster mills, it is a very difficult matter to provide hoods over the baking machines. We made this little ingenious device in which there is a grating. The bags are placed on these gratings and filled. We had to raise the wood here in order to give you an idea as to what this grating actually is. This can be improved upon, of course, but this factory previously at this point had a depth of one or two inches of plaster on the floor, and as the men walked around they stirred it up with their shoes and it was carried outside, and, of course, was a loss to the manufacturer.

This next picture shows some one's idea that this little phonograph horn here with an opening at the other end of three-quarters of an inch in diameter was sufficient to remove the dust created at this picker machine. Instead of having a proper hood above the picker, this little phonograph horn was arranged here with a pipe. You will notice it is tied on here with a rope. The opening was an eighth of an inch and was left that way. Picking machines, particularly in mattress factories, create a large amount of dust and there is a great deal of danger from fire. In a large number of these factories visited by my staff in New York we noticed places that had been on fire, and while we were taking a photograph of this machine we noticed a flash of fire from one of these fuse plugs here. Dust had collected in large amounts on top.

Section 81 of our Law provides that light shall be shaded from a man's eyes. You will notice this light is directly in front of the man and is not protected at all. All these conditions were immediately remedied, of course, but I am just pointing out to you some of the things that are done.

This last winter we had a problem put up to us in the cold weather relating to the removal of steam created in steam boxes and rollers in the steaming of cloth. The complaint was made and it was referred to another department, and that other department, not the Labor Department, had installed or recommended the installation of large amounts of fans. The more fans these people put in the more air was pulled out of the factory; naturally, in cold weather, the more warm air that is pulled out the more cold air comes in. The fog point was reduced and the more air they pulled in the greater was the fog. The manufacturer came in after the hoods had been tried and said, "We can't put hoods over these rolls. The drip from those rolls is so great that it spots our cloth. The Labor Department put a few people at work on the proposition, and we decided to try hoods made of sail cloth. The reason that umbrellas don't leak at the center is because they discharge at the edges. The hood has been made of sail cloth on the frame work of the hood. You will notice by these posters in the back that there is no steam rising. The next picture shows the steam rising up under the hood. The fan is not working and there is no drip from a hood of this kind. We also went so far as to figure out the capacity of the fan in comparison with the amount of steam discharged from the rolls, in order that the amount of steam that would come off would be neutralized or taken care of by the fan.

The manufacturer was delighted. He had no more spotting of his cloth and the employees who were obliged to work at these machines were delighted because they were not surrounded by steam at all times.

TUESDAY MORNING, DECEMBER 3

PRESIDING OFFICER: LOUIS WIARD, NEW YORK INDUSTRIAL COMMISSION

COMMISSIONER WIARD: Our sole business in Syracuse is to hold this Industrial Safety Congress, and we want to hold it promptly, so I am going to open this session. Mr. Heelan, of the Aetna Life Insurance Company, has a paper to present and following his paper we want some real discussion so that we may get real benefits from the paper. Mr. Heelan.

WHEN, WHAT AND HOW TO INSPECT

BY JOHN J. HEELAN, AETNA LIFE INSURANCE COMPANY

Ladies and Gentlemen: The subject which has been assigned to me is "When, What and How to Inspect." Any one of those parts of that subject would be exhaustive in itself, so I really believe that I am called upon to produce that combination that we see advertised so much in the way of a lubricant — three-in-one-oil. I did not believe that in assigning that subject to me it was intended for the inspection of plants mostly from outside sources, what we might term the inspection of our State Departments or Insurance Companies or private inspection bureaus. I thought that the person who had selected the subject probably had in mind the more progressive methods now being adopted in industry to handle safety work.

I was rather surprised the other day in a trip which I made down South, where we understand that the safety movement has been very limited in its activities, to find some plants in that community with a safety department and a safety engineer or a safety inspector in charge. It is recognized by the leading manufacturers today that the safety department is an essential department of their industrial establishment, and the success hoped for with inspection in connection with that department is what I had in mind in the preparation of my paper.

I have had the honor on several occasions to be associated with some of the safety organizations in the Middle West in the preparation of their programs, and I have been censured so often as one who tired his audience by a very exhaustive paper that I cultivated the habit of taking my paper the last thing before I was ready to read it and boiling it down so as to keep, if possible, within the twenty minute period. I really, therefore, have what I would term the meat of my paper.

The principle of safety should be fixed in the mind of every person interested or actively engaged in the construction and operation of an enterprise, beginning with the specifications and plans for buildings to be erected and carried on, not only to the time when the plant is in full operation, but just as long as an individual is employed on the premises.

The architect approving the plans, can be depended upon for the security of the structure, and the state law or local municipal code for reasonable fire protection as well as safety in a general way, but the different operations of the business to be conducted in and about the premises, when completed, are very important factors to be considered in the interest of accident prevention. So much can be accomplished in the matter of safety by a little effort, and with little or no additional cost, while the building plans are in a tentative state that this opportunity should be used to its utmost possibilities.

The safety and efficiency departments can cooperate in this work to their mutual advantage. The placing and spacing of machines, sufficient aisle space in all departments, and especially in those sections where considerable trucking is liable to cause congestion, arrangements for the proper handling and storage of both raw material and finished product, sufficient light and a great number of other matters should be given consideration, all of which, if proper provisions are made, will have a beneficial effect on both the production of the plant and the safety of its employees.

There are many plants in operation today where employees in going to and from their work are obliged to cross railroad tracks, pass under cranes or other lifting devices, or walk through areaways when heavy material is being handled. In some plants, there are employees working adjacent to explosive processes, injurious fumes or excessive heat, and these conditions could have been readily avoided if the plans for the building had been carefully inspected by a person whose duty it was to provide for the safety of employees and his recommendations carried out.

When alterations are being made in a plant, there is perhaps less chance for overlooking the importance of having everything done with a view to making conditions safe, but it is always advisable to have some responsible person well qualified along these lines check the work through to completion.

In addition to inspecting all building plans, every order for purchasing new equipment should be approved by the safety inspector whose duty it should be to see that the specifications call for the necessary safeguards, and when the shipment is received it should be carefully inspected as soon as it arrives. I remember an occasion a few years ago when I visited a large plant in the Middle West on a day that a carload of drill-presses arrived which were shipped by a reliable machine tool manufacturer. The safety engineer at this plant was the first person to enter the car, and upon finding some of these machines not properly guarded, he gave instructions not to unload the car until he could communicate with the manufacturer from whom they were purchased. He decided to accept the machines only after being advised by wire that the necessary guards were being shipped by express that day. Such action by every purchaser of machinery will promote the already growing tendency on the part of manufacturers to so design their machines that the minimum amount of safeguarding will be required after the machines have been installed in the plant where they are to be used.

It is, of course, necessary to have all new equipment personally inspected and approved by the safety inspector before it is finally put in operation.

So far we have considered the inspection of the plans for buildings and equipment, but as we have to deal chiefly with plants already in existence and where these preliminary inspections and the resulting safety measures have not been made, it is necessary to plan out inspection work to meet these conditions.

There are so many different classes of industries and such a wide range in size between plants of the same class that it is impractical to formulate a uniform rule for making inspections. Each individual plant must be considered separately, taking note of the character of the operations and the number of employees, in order to determine the kind and frequency of inspections to be made, and while we have found that it is advisable to have continuous inspections of such plants as steel mills, foundries, shipyards, and the like, this intensive inspection service hardly seems necessary in printing establishments, bakeries or clothing factories. This question must be largely settled by the safety inspector himself. After making a few trips through the plant, he can readily determine whether more frequent inspections are necessary to accomplish the best results or if the same results can be obtained by a longer interval between inspections. A few departments can probably be selected which will require more attention than the rest, and he can arrange to visit them at times other than when making inspections of the whole plant. In the pouring-room of a foundry, for example, it is very desirable to have a visit from the safety inspector at least once a day in order to discover any careless practices in the handling of material or equipment and to take such corrective measures as may be necessary. Frequent visits by the safety inspector to departments having a bad accident record are constant reminders to the foreman that work should be done in a safe manner, and things should be kept in proper order. A foreman naturally dislikes being criticized daily for the cluttered condition of the aisles, guards out of place, dangerously piled material and other unsafe practices, and will soon conduct his department so as to avoid this criticism, impressing on his workmen the importance of performing their work in the safest way. The safety inspector who secures the friendly cooperation of the foreman has made a good start on the road to success and relieved himself of much of the routine inspection work which would otherwise be necessary. A foreman, by reason of his more intimate knowledge of conditions and constant association with the workmen, is in a much better position to detect and remedy unsafe practices and conditions than the safety inspector, and should be encouraged to think of himself as the representative of the inspector for his particular department.

Too many manufacturers underestimate the value of an inspection made by a person from outside the plant. If we are still of the opinion that experience is a good teacher, is it not reasonable to conclude that an inspector who has been going through plants for years, learning the causes of accidents as well as the various means used for their prevention, has obtained knowledge which will be of great value to those men who secure his services? A condition which appears safe to the owner of one plant may be found to have been the cause of a serious accident in another, but in all probability would remain unchanged unless brought to the attention of the owner by some person having a wider experience in accident causes and prevention.

The question of what to inspect, the same as that of when to inspect, must be decided for each individual plant, and no attempt will be made to enumerate here any part of the large number of items to which an inspector should give his attention. The National Safety Council, in their Bulletin No. 351, has published a rather detailed and comprehensive list of such items but even this would require careful amplification and revision to meet the needs of any particular plant. A study should also be made of the hazards connected with the industry carried on at the plant and close attention given to all matters having a bearing on these hazards.

The safety inspector should receive notice of all serious accidents as soon as the accidents occur, and make a personal investigation of the accident with the idea of obtaining information which will enable him to prevent a similar accident in the same department or elsewhere in the plant. It is advisable to keep a record of all accidents as the cause of a minor injury today may result in a more serious accident at some time in the future.

And not only should a safety inspector be able to prevent the recurrence of an accident, but he must possess sufficient imagination to picture an accident where one has never happened, if conditions indicate such a possibility. How often have we heard an employer say that none of their workmen was ever hurt on this or that machine? Very little progress would have been made in the prevention of accidents if all of us possessed "Missourian" ancestry and waited for a person to be injured before providing a safeguard.

There are different opinions expressed as to the best procedure to adopt in making inspections, but some definite plan should be adopted to suit the particular plant and that plan followed. At certain intervals the building with its stairway, floors, walls, fire escapes, lighting system, fire apparatus, and similar features should be gone over carefully. At another time it might be well to inspect elevators, cranes and other lifting devices; this plan may be followed out with respect to the power transmission, machines, yards, and so on, until the entire premises have been covered by inspection.

Whatever procedure is followed, sufficient time should be taken to make the inspection systematic and thorough. It is impossible for the safety inspector to work "by the clock". All inspections must be planned, not to meet the convenience of the inspector, but so they will cause the least amount of interruption in the regular work of the plant. Elevators and cranes, when in use constantly during the working day, will have to be inspected during the noon hour or before the shop opens in the morning, or after it closes at night.

Of equal importance with the inspection itself is a written report describing the dangerous conditions found and the recommendations made for changing these conditions. All recommendations should be discussed with the proper operating official who has the authority to make the changes, and they should be followed up by the inspector to make sure that the changes are made in a reasonable time. The excuses offered for not having done the work will be many and varied, and not the least of the duties of the inspector will be to determine those that are legitimate and find means of stimulating the activity of those persons who are inclined to be passive toward safety work.

In making inspections, as well as throughout all his work, the safety inspector should keep in mind the fact that safeguarding alone, no matter how thoroughly it may be done, can never take care of more than relatively a small percentage of accidents, for ignorance and thoughtlessness are the causes of most accidents, in whole or in part. Safeguards do prevent accidents, however, and they tend to reduce the seriousness of accidents which they cannot altogether avert. Their provision also has a material influence on the educational side of safety work, and it is the educational phase of the work which must be emphasized until every employee from the highest official to the lowest workman realizes that safety in industry must be an integral part of the institution if the plant is to work at highest efficiency. A plant without safety is like a garden choked with weeds, for its output cannot equal that of the plant in which there is a stabilized force of workmen.

It takes but a few months to build a plant and equip it with the required machinery, but it takes years to carry on the process of selection, and the weeding out of incompetents before an efficient working organization is established. Failure to maintain that which has cost so much in time and money to build up is a serious waste to a concern, and is bound to retard its progress.

If we are ready to acknowledge that safety is an essential part of industry, we should proceed to make it a part of the system in effect in the plant for getting out production. In every well conducted manufacturing plant each department is expected to establish and maintain a certain record of production, which is usually graphically pictured by means of charts and curves. Any reduction of this record is thoroughly investigated and the cause, if found, promptly corrected. A similar method may be profitably used in recording accidents, and will be found a simple means of securing the interest of the foremen, as a comparison of the production and the accident curves will prove the close relationship existing between them. In the majority of cases a high production curve will accompany a low accident curve and, conversely, a low production curve will be associated with a high accident curve. As soon as the foremen recognize this fact the safety inspector has secured their earnest co-operation and the hardest part of his work is accomplished.

Classifying accidents by departments in which they occur is another means often used by the safety inspector to further educate the foremen and arouse their interest in accident prevention work. While some of the accidents are of a general nature and liable to happen in any part of the premises, a considerable number will be of a special kind and peculiar to certain departments. Obtaining information of the particular kind of accidents attributable to the different departments enables the inspector to localize his difficulties. It furnishes him a target at which to shoot so that in each department he knows his problem and can concentrate his efforts on solving that problem rather than working on generalities; such a system also provides an opportunity for measuring results, and the effort of each department to improve its record creates a friendly rivalry which stimulates the interest in safety work throughout the plant.

This discussion on the classification of accidents may appear a disgression from the subject assigned me, but to my mind such a classification is entirely necessary in order to make the most intelligent inspections and to secure the best results from inspections, and for that reason has been included with the idea that it may be of value to the man who is just starting his career as a safety engineer.

There appears to be an exceptional opportunity for progress in safety work at this particular time. The average American workman of today shows a sort of reluctant attitude toward discipline, which is demonstrated in the removal of safeguards or the failure to use them. The military training of millions of these workmen should have the effect of overcoming this situation to a large degree, and with their return to industry more hearty co-operation is expected. It is, therefore, desirable that employers take advantage of this opportunity by devoting greater attention to the conservation of man-power through the prevention of accidents.

Let it not be said of our victorious boys who faced the enemy on the battlefields of France that they came back to their peaceful occupations and were turned out of industry as dependent cripples.

GENERAL DISCUSSION

Commissioner Wiard: We are now ready for a general discussion of Mr. Heelan's paper. Do you want me to take it for granted that he told you all there is about when and where and what to inspect and that it is absolutely right?

Dr. L. W. Hatch, Chief Statistician, New York Industrial Commission: I was much interested in what Mr. Heelan had to say about classifying accidents in individual plants. In the Bureau of Statistics and Information of the Industrial Commission we are constantly classifying accidents for the whole state. I have been a good deal impressed recently with the possibilities of valuable information a firm can get by the classification of its own accidents. A single plant can do a great many things that we can't do for the state as a whole because when you come to classify sixty thousand compensated accidents and from 275,000 to 300,000 accidents a year, you can't go into detail as you can in a single plant where, perhaps, there are some two hundred or a thousand accidents during a year. In the individual plant it is possible to carry your classification of accidents to the very last item that has to do with the causation of the accidents.

I recently saw some figures prepared by one firm which has a number of plants in the State. That firm prepares quarterly a very detailed classification of its accidents, showing not only whether the accident frequency and severity is going up or down from quarter to quarter but pointing out just exactly what has happened when it does go up and down as to the causes of the accidents, whether certain causes are being eliminated or whether they are not being eliminated. The last quarter of the report which I saw seemed to me extremely valuable and a fine example of the practical uses of statistics, because the firm was able to show that the frequency or severity had declined somewhat, but instead of simply indulging in certain self-congratulation over that fact, it went to the next sheet which pointed out that while certain causes were evidently being removed as a source of accidents, there were still some other sources, which were to a considerable extent within possible control, that were continuing to cause just as many accidents as they did before. I can't conceive of anything that is more pointed, more calculated to stimulate interest and especially more calculated to secure attention to the causes of accidents.

It is possible for an individual plant, with a limited number of cases, to make an analysis and classification which will actually enable them to put their finger right on the point where the accidents come from.

Mr. W. J. Picard, New York Industrial Commission: The gentleman referred to the architects being in a position to determine the preparation of their plans and safety features to be incorporated in the construction of buildings. If I understood that correctly, I desire to take issue on that point in view of my experience. In examining some thousands of plans of factory buildings, I have found that the architects, engineers and contractors have very little idea of the safety construction of factory buildings. It is my impression that if the plans of all industrial buildings were submitted to a central authority for examination and approval, a great deal of expense would be eliminated and considerable time loss eliminated in the construction of buildings.

MR. H. G. MEACHAM, Goulds Manufacturing Company, Seneca Falls: Dr. Hatch has spoken with regard to the classification of accidents in plants. I want to say that I have had a little personal experience in that which opened my eyes to the importance of just that work. Taking the number of accidents that happened in our plant over a period of two years and a half, I found that out of the number of accidents that occurred only one-seventh could have been avoided by proper machinery, or rather by proper machine guarding. The rest of the accidents were caused entirely through a lack of education, through the fact that the employees had not been properly educated to take care of them. That is something we wouldn't have known without the classification Dr. Hatch mentioned. I believe that is a very important thing.

DR. E. B. PATTON, New York Industrial Commission: The speaker said, as I understood, that ignorance and carelessness were the major causes of accidents. He laid stress on the importance of the relative value of machine-guarding. As to the other causes, I don't care to say anything, but referring to the truth of the statement that ignorance and carelessness are the chief causes of accidents, many of you may remember the remarks that Mr. L. W. Chaney of the U. S. Bureau of Labor Statistics made last year as to the relative accident causation due to carelessness. His remarks at that time impressed me very much. I have read and heard much on this topic since that time, and, although I am entirely without practical experience in the matter, I am absolutely convinced that we are wrong in attributing to carelessness many accidents that are really due to ignorance. Mr. Chaney said that " engineering revision " is what we need, and what he meant by that was that when a workman goes to a new job that workman should not be told merely to be careful; that specific workman should be instructed how to do that specific job; the foreman should not give him general instructions to be careful; he should, on the contrary, give specific instructions how to handle this machine in this particular way and say to the man, " If you do this job, if you handle this machine in this manner, you will be safe; you won't get hurt. If you do not handle this machine in this particular manner, you will be hurt."

I am firmly convinced that it is not so much carelessness on the part of the workers that causes accidents as it is that the workman doesn't know how to do his particular job in the way which is safe for him, and Mr. Heelan's statement, I should say, should be changed to convey the idea that the major cause of accidents is ignorance rather than carelessness. If I understood the last gentleman's point of view, he would bear me out exactly. It is instruction and education in the work that is needed to prevent the accidents.

MR. G. C. DANIELS, New York Industrial Commission: It seems to me that accidents caused by carelessness could be very largely ascribed to the subject before the body this morning. Most poor housekeeping is carelessness; most carelessness results in poor housekeeping. The accident does not always, and I am convinced it does not usually, occur to the man who is careless. The person who throws down boards with nails in them is not apt to be the man who steps on the nails. It resolves itself down, not to the carelessness of the person who left the nails on the floor altogether, but to the carelessness of the person whose duty it is, or should be, to properly inspect the plant. The gentleman who read the paper said that in certain classes of factories, I think he mentioned the clothing factories or establishments, inspection need not be made so often. I beg to disagree with that. I think those are the places where there are apt to be more accidents because of smoking and other careless habits of a cheap class of help who are not thoughtful and who need the most attention from the inspection force.

COMMISSIONER WIARD: Is there any further discussion on this paper?

MR. H. P. BROWN, Factory Inspector, New York Industrial Commission: I don't want to give expression to anything that is foreign to the subject, but the thought suggested by the gentleman preceding Mr. Daniels, which I will explain, came to my mind because of the experience, personal experience and actual factory work, that I have had. He said, as I understood him, that a great many accidents occurred because the employee did not understand the best manner in which to do a job or to do certain work without injury to himself. Instruction is all right, but we don't want to carry instruction to a point that is too far the other way. The employee in a factory has to have a certain amount of initiative. He has to decide for himself how a job ought to be done in the most effective and in the quickest manner. Sometimes his idea as to how a job should be set up or done on a certain machine is all right; sometimes it is wrong, but if it is attempted to set any hard and fast rule for him, it might result in a loss to the firm because he might have ideas which, if he were allowed to try them out, would be far more effective than the one set for him. I think we should allow a certain amount of initiative as well as judgment in the carrying out of methods in the factories.

MR. HEELAN: I believe Dr. Hatch brought up the value of accident records in individual plants. I say that unless you localize, I don't see how you can measure your progress and know where you are getting.

As an illustration, a very large automobile truck manufacturing concern had a lot of hernia cases last year. We started an investigation and we found that in a certain department at noon time they assembled, that is the workmen, to eat their lunches. There were a lot of farmer boys working there and they used to make bets on how much they could lift and they would pick up a five-ton truck and swing it around. That was the cause of the hernia cases.

There was a point brought up on the question of carelessness and ignorance. It would be hard to confine it entirely to ignorance, and at the same time I dislike the word "carelessness" myself, but we do find cases where it is absolutely true that a man will swing a scaffold up a shoe-string, knowing that it won't hold, that is if he stops to think he knows it won't.

The real safety movement is a co-operative movement, and when the workman is enlisted into that co-operative movement and that co-operative spirit, then we obtain what we are after in the way of education and we do eliminate a lot of ignorance and carelessness.

Commissioner Wiard: Our next paper is "Maintenance and Repair and their Relation to Safety," by Mr. Chester C. Rausch, Assistant Director of the American Museum of Safety.

MAINTENANCE AND REPAIR AND THEIR RELATION TO SAFETY

By Chester C. Rausch, Assistant Director, American Museum of Safety, New York City.

Mr. Chairman, Ladies and Gentlemen of the Safety Congress: It is always an interesting fact to have your thoughts anticipated and to see them more or less spread out before you in order that when the time for you to speak arrives you may possibly be able to analyze your thoughts to suit the temper of your audience. It is interesting to me and it may prove interesting to you, to find that much that I will say regarding maintenance and repair has been covered in some of the remarks of the previous speaker and those who have spoken from the audience.

From the time we are first able to comprehend the words of our parents until we are passed to the hereafter we go through a process of learning. We learn by our own mistakes. We more frequently learn by the mistakes of others, but the combination of these experiences of mistakes and the work of others which we are able to observe is the means whereby we improve our own knowledge of the work that we have to do and the conditions that exist in the world in which we find ourselves to-day. This thought, then, must also bring to mind the restriction that must necessarily fall upon a speaker in talking to an audience composed of as many different thoughts and angles of looking at a subject as there may be persons in the audience. Therefore, what I may say will have to be taken with the restrictions that are naturally placed upon a general paper when it is presented to an audience, and the remarks that I may make, perhaps if spoken to you individually and conducted in the form of a conversation, might carry my thought to you more clearly than it will by my speaking to a number of people with the idea of carrying a few fundamental thoughts to you all. I ask, therefore, for your indulgence to that extent.

The average business man is in business to make money. The fundamental purposes for which most of us exist consist of working in order that we may get money in some form to make our living comfortable, that we may have a home and family and care for them in reasonably good shape and that they may enjoy some of the luxuries and pleasures which make living worth while.

There are four things, really, which concern most business men. They are these: The securing of raw material; the manufacturing of that raw material into a finished product by means of labor; the placing of that product in the necessary markets, and the collection of funds and the distribution of funds in order to make those processes possible. We are concerned, perhaps, this morning more particularly with the production of that portion of the work which is covered by the idea of manufacturing raw material into a finished product.

I have jotted down a few notes that have come to me in thoughts from an experience that has covered a number of years in which I have worked as a workman, in which I have been able to guide men in processes of construction, power generation, etc., and more lately in the inspection of a large number of factories which I investigated when I was employed by an insurance company, and more lately still, problems brought to me by those interested in the safety movement. Therefore, I am bringing to you not my own particular experience but the experience of others.

What I wish to do first is to show you how a new conception has grown and then show you how that conception takes concrete form in our every-day problems through the system of maintenance and repair which, in the final analysis, perhaps has more to do with the comfort of our working in factories and our getting about to and fro than any other one thing, We are familiar with the fact that every working process follows some definite law. Many times the word rule is used to describe a process which is nothing more or less than a custom. It may be understood or it may not be understood.

I may mention as an illustration one that comes to my mind. In years gone by, it was customary for tanners to remove the hair from hides by very unusual and rather disagreeable processes of putrefaction brought about by the use of animal excretion of certain types. Certain men believed that the excretion of one animal was more valuable than other. Since that time, science has shown that the process of removing hair is the process of fermentation brought about by bacteria which can be artificially produced by clean chemicals more quickly and with less damage to the hide than by the old process of putrefaction. In that way there has been eliminated many opportunities for infection and disease that were unnecessary. It shows that as time goes on a great many new thoughts are developed and the reason for them made clear. Nature follows her own laws with inexorable rigidity. The law of gravity, of expansion from heat, of contraction by cold, the forces of wind and fire, the chemical actions and physical actions, with which we are familiar, go on regularly without any hindrance from man, and many of our difficulties have been traced to the fact that we have not been willing to accord nature an opportunity to assist us.

If the safety movement has done one thing more than another, it has brought us to think in a new line and to enlist the help of nature in eliminating many problems that were directly traceable to our own negligence and direct failure to recognize and use the laws of nature.

Invention, science, and the work of men who devote their entire time to study of problems of this sort, have contributed much. It has been my good fortune, as I have said, to look at the angle of safety from a number of different points, from the workman's point, from that of a man directing labor and from the point of consulting with those whose opportunities cover a great many fields. I have been led to believe that a new conception of the work involved in safety has taken place. It comes about something in this fashion. Years ago men worked in reasonably small groups. The village shoemaker, for example, would go to a neighbor of his who would kill a creature and have the hide tanned in a tub in the back yard, it may be the bark could be procured for it from their own wood lot. He later took that hide, cut it up and made shoes to the measure of men who happened in his shop. That is only one process.

The homespun goods have to-day developed into the enormous factories of silk, woolen and cotton goods and production on an enormous scale. In other words, where formerly the forces employed were concentrated in reasonably small locations, involving only few people, they have spread until to-day thousands are employed where before hundreds were employed. We use now enormous power in operating our mills where before a small watermill or a treadmill or a small steam engine was sufficient. All along the line, therefore, new hazards have been produced. New equipment has been placed in such a way that unless the dangers involved are recognized great harm can be done. Yet those same forces which serve us can be controlled in a reasonable manner and are being controlled, and it is my idea that it is the duty of this Congress to absorb, each time that it meets, as much new material as it can of the methods that are being employed to bring this about.

It has been said by some of the previous speakers, and there has been much printed on the subject, that carelessness of the workman is responsible for a great proportion of the accidents which occur. That may be true, but it must not be taken without some consideration. I have found in my experience that the average workman is a reasonably intelligent and logical human being. His method of thinking and planning may not be exactly the same as yours or mine, but if you can show him concisely and clearly the reason why you ask him to use a particular type of clothing, or to use a particular type of safeguard, or to travel a certain route to and from his work, you will find that once the man has grasped the reason for that you will have no difficulty in getting his co-operation.

Foreigners and those who are not able to speak our language readily must, of course, be treated with further consideration and in their own tongue, if possible. I will say with all the emphasis that I can give it that the average workman does not desire to harm himself or those with whom he works. It is merely the fact that he is too frequently turned loose on a job without proper instruction or without appreciating the dangers involved both to himself and those who work near him.

In studying statistics we are apt often to be led astray. It is easy to separate accidents, if you would consider them as a unit, into two classes, those caused by an act of God or unforeseen circumstances, or those brought about by carelessness.

It is interesting to note that in the great movements that have come about, and the improvements made, very often men were working on the same problem unknown to each other. That is proven in the fact that two men were working on the transmitter as we know it at the same time. Bell naturally received the credit because his invention was declared first. I have in mind two men who have investigated accidents from a purely analytical standpoint, both men excellent in their field and recognized as capable to render a decision from the study of any statistics. Dr. Chaney has already been mentioned and represents perhaps the pure technical study of statistics, and David S. Beyer, well known to most of us, has studied statistics from the insurance standpoint, but also from the standpoint of the workman. Their study shows that the greater proportion of accidents when finally analyzed to their conclusion show that not the workman who was injured was careless, not the man who constructed the factory or the particular point where the accident occurred, but the man who designed the structure, who laid out the work, or possibly in conjunction with him, the man who dictated the financial policy of the concern, who saw fit to clip off an allowance suitable to bring the thing about as originally shown and created in the plans.

I will illustrate with some concrete evidence exactly the sort of circumstances that come from that kind of thing. In the design of a building, it is just as reasonable to provide safe ways to equip the machinery with safeguards to distribute the power and the light and the heat in a manner that will not harm the employees as it is to consider the financial policy of the stocks and bonds that may be issued or carried on to run the business.

You cannot cut off one wheel of a wagon without having a difficult situation. You can take off two hind wheels and still have a passably good rig, but you can't carry with convenience the same load that you could with a four wheeled rig. Every part of the machine must be considered and must work in unison. The human element and all things that affect it are vitally concerned with the product of the plant, it makes no difference what that product is, a manufactured article, a public service or what-not. All those men concerned with it and the problems relating to their personal comfort and the conditions under which they work are a part of the problem.

These points where maintenance and repair show up most prominently are listed very carefully, I think, by a number of people, but I would mention a few that I have in mind because they show the heads under which very often work can be carried out by special men. The man whose duty it is to look after the plant should have an experience broad enough to fit him for the work, but he should be above all a man quick to comprehend where dangers can occur and the necessity for performing repair and maintenance work in the best shape, and he should not be restricted by the help allowed him or the funds available. It is wrong to compel a man of that sort to always have to work on Sundays and holidays to crowd his work through. By proper care and arrangement, much can be done during the ordinary course of the work and thereby eliminate accidents to his crew that may result from crowding all maintenance and repair work into short spaces of time.

Consider some of the places where inspection, maintenance, repair and so forth are concerned,— in the building, the frame of the structure, the condition of the roof, the condition of the building frame as to corrosion, rust or what-not, the enclosing structure, whether it is wind-proof, water-proof or either, the floors, walks, lighting equipment, ventilating equipment, toilets, elevators,— everything. Then come to the protection of the machinery and keeping it in repair, whether it concerns the power distribution or the machines themselves. Every factory has problems peculiar to itself. The foreman, the men under him, and the workmen, as has been said, are very often better able to detect early the place or the nature of an accident that may occur or of a failure in apparatus. Therefore, through them there should be cooperation and some ready means of quickly carrying that fact to the proper parties in order that that repair, that change, whatever it is, may be brought about quickly. I have in mind a mill where many machines are used that require frequent adjustment. They devised a system of red lights so when a machine was out of order it would be indicated by this light and the adjustment crew or repair crew would come along and put that machine in shape.

The idea that much of the injury that is brought about is due to equipment faultily designed is a growing one. I have had an opportunity to hear the expressions of a great many men on that point, and, aside from what has been shown by statistics, there is a growing feeling that much can be done in eliminating the causes of accidents and not, thereby, subjecting the men to the need for being in the vicinity where equipment may fail and cause them harm.

I have chosen, therefore, a few typical illustrations, and I shall explain them somewhat in detail in order that you may possibly catch my point more clearly, that you may possibly get some point that will help you, and that you may see that what I say is true, that by analyzing a few typical accidents and going back to the original cause you will be convinced that the cause was not the carelessness of the maintenance crew or the repair gang but that the fault was inherent in the structure or machine or equipment itself.

Let us take, for instance, an illustration that is familiar to most of us. It is particularly familiar to me because it strikes at the line which I am accustomed to use. I have reference to the accident that occurred in one of the lines in New York, the Brooklyn Rapid Transit line going out toward Brighton Beach. I use that line daily. Therefore, I speak with some feeling, although I was away from the city at the time the accident occurred.

That was a case where evidently somebody had sought to use their own discretion in two particular instances, both contributory to the accident. The first was that the engineering concern had presumed to lower the super-elevation on the rail upon which that train was to turn into the tunnel. That may or may not have had anything to do with the accident. The other was the fact that a man was compelled to take a train who was not trained to operate it. He should have refused, to be sure; that was carelessness on his part. The man who compelled him to take the train was also culpable to a greater extent, but the conditions which allowed that to come about were also contributory, and the ramification of that particular accident goes out to a large degree to a number of persons, but in no way could you say that the passengers who took the train in all good faith were to blame in any way for the accident.

I was reading in the paper not long ago of an accident that occurred in the Middle West where a boiler had failed. Close examination showed that the heads of the boiler had been badly corroded, not only corroded but made very brittle. The cause for that was not carelessness on the part of the fireman or the water tender. It was not carelessness on the part of the man who designed the boiler. It so happened that the water in that boiler had been changed. The town supply, which originally was from a surface source, had been changed to an underground source. As a result practically a free alkali, caustic alkali, had been created in the boiler by the evaporation of water in which alkali was present, and the constant strengthening of that alkaline solution in the boiler caused the damage. That was a condition which would have brought about, in a very short time, a serious catastrophe. There was apparently no negligence on the part of any person, and yet the condition was one which would have been directly recognizable had it been the custom in that plant to have no change take place without a thorough study.

I have in mind a process whereby the presence of iron in very small quantities, iron filings or what might have been tracked in as rust by a man who had walked on a rail or in the vicinity of iron, produced an iron ink stain on the product. It was a long while before anybody discovered how that came about, and yet it shows how very often the cause is clear when you understand it but it requires research, careful study and thinking in order to follow back through the channel that will lead to the cause of the accident or the disturbance.

I read in a paper not long since of the death of twenty-five men and of the serious injury of a half dozen others who were working in a blast furnace relining and working over stoves and carrying out changes. Those men started work in all good faith. They may have had proper staging, they may have worn goggles, they may have protected their hands with gloves to prevent cutting the skin with the bricks, they may have done everything that could possibly be done, and yet they were asphyxiated because the valve was not tight and suddenly leaked monoxide into the chamber where they were working. The negligence was not on the part of the workmen. There was no way in which you could say that the workmen were careless. The carelessness reverted to the man whose duty it was to see that that gas was shut out of those chambers. Yet, he may have shut that valve in all good faith, but the valve may have been imperfect in its operation, and that would carry the blame back to those who were responsible for putting in a valve that might get into that shape, or in not providing something to prevent that condition from coming about. There, again, you have contributory negligence running back three or four generations, if you will.

A man came into my office the other day and said, "How can I protect my belts from nitric acid?" He went on to relate a chain of circumstances whereby in the process of manufacturing the acid slopped over and ruined his belts, and they had spent a considerable sum of money in trying to find a belt that would stand that and wear a considerable length of time without failure. A number of means had been suggested whereby that belt might be protected. He made his recommendations. The concern employed a chemist at a considerable fee per day to devise some methods of protecting the belt chemically. He evolved a belt dressing that could be put on, which itself was a considerable sum per barrel. It was tried and it failed. A suggestion was made as to whether there was not some means of preventing the acid from slopping over. That question brought a solution in this way: In the examination of the plant it was found that an overflow to care for the excess rise in acid level had always existed, but it had been plugged up by a piece of cotton no bigger than your fist. That was straight maintenance, but it cost a great deal of money to discover that plug of cotton and remove it, and it had necessitated the employment of a considerable amount of talent that had worked on the wrong track. Were those men who were obliged to work on that machine responsible in any way because the maintenance crew had failed to do its work?

I leave that thought with you because very often, if you take an accident and go back far enough, you will find a simple cause far removed from the operator and to which in no way you can say he contributed by his carelessness.

Let me cite another instance that came up. A man wanted to know the best method to guard some punch-presses. A punch-press is a classical subhead in the safety movement; it goes with goggles and nails and a few other things of that sort; it is fundamental in all safety work. He wanted to know the best type of punch-press guard. I was led to ask him a few simple questions as to whether or not, for example, he had cut down the area of his die to as great an extent as possible, if he had reduced the travel to only the necessary amount, if he had tilted his press in order that the material might fall away from the press by gravity and not require removing, if he had done anything toward a magazine or dial or type of feed that would keep the man's hand away from the machine. Those few fundamentals had not been considered nor had anything of that kind been given thought. In answer to those questions, he eliminated the need for guarding eighteen out of twenty presses, and for the other two a very simple guard was sufficient.

That thought may suggest a new train of action on part of some of you, that is, the studying of the conditions about a machine and seeing what simple things, if done, will do away with the necessity of more complicated solutions.

I have in mind a drinking water system at which a man applied one morning for a drink. He bent over the bubbler and was met by a burst of steam and hot water that seriously injured his face and was the means of ruining one eye to the extent of its later being removed. That man was in no way culpable for going to that fountain to drink. The cause of that accident was this: The pipe which supplied the cold water was also connected with a pipe that supplied a tank with hot water, and in that pipe was a steam coil for heating the water. There should have been a check valve between the hot water tank and the cold water supply to keep any water from backing up into the cold water supply. It so happened that during the day the pressure on the supply line dropped appreciably, sometimes thirty or forty pounds. The steam, therefore, in the hot water tank was able to create a temperature and pressure great enough to back out into the cold water line all the cold water there was and enough of the hot water to extend to the particular fountain in question. The tank was supposed to have, and did have, a thermostatic control to shut off the steam when the temperature reached a certain point. The steam line supplying that tank was supposed to have, and did have, a reducing valve at the boiler to prevent the temperature in that line from rising above a certain point. The man who was injured was not in any way to blame. The check valve was the fundamental piece of engineering that was wrong. The thermostat was out of kelter because the only man who knew how to operate it was not available and they took no trouble to get some one else; they thought he would be back soon enough to fix it. The reducing valve on the other line which supplied the steam had been put out of commission because the repair gang wanted to use steam from that line to supply another tank instead of the line they should have used because the regular line was temporarily down and they didn't want to take the time to repair it.

There, again, you have a series of responsibilities concerning both the engineer and the workmen, but the party who was injured was not the one to blame.

I have in mind a punch-press that insisted upon repeating. It was discovered that the pulley on the drive-shaft was put on a slight bit out of line and the lower end of the belt which came from that pulley, where it passed around the fly-wheel, was just clear of the trip-lever which came off by hand operation. Frequently, that belt would slide across and slip in on top of the lever just enough to trip it and cause the repeat. It shows that a problem can be simple and yet go on for a long time because no one happens to get their eye on the particular point at the right time. That was a matter of maintenance. The chances are, if that pulley had been true, the difficulty would not have occurred.

In one instance, a derrick was to be used to take a tug-boat out of the water. It happened that a certain individual went by that point and discovered that the interior of the derrick, made of steel construction, was full of water, and the question came to his mind as to whether or not corrosion had taken place. An examination showed that the structure near the foot and socket where it swung out over the water and back was completely rotted through, and it was only because of the extra strength of the ribs that the thing was held in place at all. There, again, is a problem in maintenance. That thing should have been kept free of water and painted. It was primarily a lack of proper drainage in the design of the structure.

I have one more illustration which is rather unique. We often wonder what becomes of old movie films when they are destroyed. There have been a number of uses evolved, but one use was to dissolve the film in alcohol and to impregnate felt and dry that felt with cellulose or celluloid structure within the fibers of the felt and to press it into various shapes, into box-toes and counters for our shoes. They make admirable counters and box-toes and are being used to quite an extent. The company which originated this process spent a great deal of money experimenting. For two years they kept a chemist and his assistants at work. They studied and worked on it. Static electricity had to be taken care of, and it was a considerable problem. The fumes were taken care of by condensation. When they came to put up their final plant, they put up a reinforced concrete structure. They placed a refrigerator in it for recovering the gases. They spent a great deal of money in making everything as safe as it was possible to do.

One day a workman discovered a small flame within one of the drying chambers. He opened the door to examine it and to see to what extent the flame had permeated the structure, and he and a great part of the machine went out through a second-story window and landed in the yard. It was not for some months that he recovered his senses enough to tell even what had happened.

Let us see what took place. As the material went through the drying chamber it was heated and from it came water vapor, ether and alcohol. That was carried to a place beneath where it was run over cold pipes with the idea of condensing the ethers, the alcohols in the water, and recovering them for future use. As the material dried, a great deal of static electricity was developed, and tinfoil and the like in the form of wipers had been placed in the structure to remove all static electricity, and yet for some reason the thing took fire. A great deal of thought was given to determine a solution, but nothing had ever been brought about that gave a reasonable clue as to what had taken place.

Something like a year later I mentioned this situation to a friend of mine who was a chemist. He said, "Why, the solution is perfectly simple. It is a fact that when ether vapors are suddenly condensed within a very restricted area, as particularly in this case, static electricity is generated. That probably ignited the lighter gases above the point of condensation, and that fire had immediately traveled back into the chamber where it set fire to the gas as it came from the material being dried. The man on opening the door had furnished by that simple action a little gust of fresh air which, with the gas in the chamber and the presence of the flame, produced the elements of a combustion that was rapid enough to come under the head of an explosion."

That is a case where only the finest sort of engineering would have detected the cause of possible accident.

I have related these different illustrations because they show the train of thought that is necessary frequently to determine the cause of an accident.

I want you to feel that education has its part in protecting the workman, but no amount of education, no amount of guarding of machines, no amount of preparation of any sort, kind or description that you can prepare in advance will protect any workman from the neglect of the original design that is faulty.

If I would leave one thought with you, it is this: That those of you who are in any way responsible for maintenance and repair keep your eyes eternally open for those hidden, unseen places where accidents originate, and by finding them and keeping in touch with those who design future additions or changes, have only the best incorporated in the structure and have the processes so changed that they are kept up to the modern ideas, so far as discovery improves them, so that the men with whom you work and for whom you are responsible shall be protected.

I might mention, in closing, one other thought that is being brought home more and more each day. We have heard it in many forms. It has been attributed to the war. It may or may not be due to that condition. Most of use live here in order that we may work, that we may move about our daily toil and have comfort and that we may get some enjoyment out of life. We have lately sent the best that we had to carry that idea to the other side of the Atlantic ocean. We have enlisted our impulse toward the freedom of the world in order that men may live as we live and enjoy the things that we enjoy. The small part that we may do is often not spectacular. The maintenance and repair men go about each day doing those things which are sometimes irksome, hidden, and appear not in the least spectacular, but they contribute just as much to the comfort of us all. The man who greases the wheels of the car in which you ride may prevent you from waiting an hour on account of a hot-box, delaying your plans and making you miserable in your mind. So it goes through any field of activity you may choose. The little things that come under maintenance and repair are important; the little thing that causes the wheels to gum and refuse to keep moving along so that production is increased and men are able to work safely and conveniently is worth noticing.

If, then, I might sum up what I have said, it would be merely this: Do not blame a man for ignorance when he has not the opportunity to know the conditions under which he works that may harm him, and use your influence, so far as it may be used, that engineering revision, if you choose to call it that, or plain ordinary engineering, if you choose to call it that, or plain every-day common sense may be incorporated in the plans and incarnated in the work in those plans with which you are concerned. If we can bring that about, we have added not only to our own peace of mind and comfort, but to that of all those with whom we work. Since work is the main object of our lives, we should not fail to take the opportunity to make it easier and more enjoyable in that simple respect.

GENERAL DISCUSSION

COMMISSIONER WIARD: We are ready for a discussion of this subject.

MR. S. S. LANDON, Todd Protectograph Company, Rochester: It seems to me that the speaker has handled this maintenance and repair proposition in a very scientific manner. The only thing that develops along that line that he could have added was the classification of repairs. We find in the classification of repairs in our plant that there are three thousand general repairs, running repairs and emergency repairs.

During this acute condition of getting labor to take care of these repairs, most everything has been dropped into the emergency column, and it just seems as if one emergency happens after another.

His application of the check valve was very good, because only a short time ago we had difficulty in getting water through one of our boilers. The gate in the check valve had broken away and entirely shut off the water from the boiler. It was necessary to proceed to get that check valve repaired. We had another instance where a check valve refused to work and nobody knew what the trouble was. It seems to me that the study of maintenance and repair can be given considerable attention. We would then eliminate many of the emergency repairs if we could but follow that idea of the three classifications — general repairs, running repairs and emergency repairs.

COMMISSIONER WIARD: This session will stand adjourned.

TUESDAY AFTERNOON, DECEMBER 3

PRESIDING OFFICER: EDWARD P. LYON, NEW YORK INDUSTRIAL COMMISSION

COMMISSIONER LYON: Those of us who have attended from year to year these Safety Congresses must have been struck with the growing interest, attendance and scope of them. This, I think, is the most interesting as well as the best attended and the widest in scope of any we have had.

The State of New York has certainly made great progress in taking care of the financial element connected with industrial accidents. The old plan of compensating a man when he was injured had with it some very serious handicaps. In the first place, in about nine cases out of ten the injured man got nothing, owing to the strict rules of law which prevailed, and if he got anything, he generally got it after his most pressing necessity for it had passed away, and then, owing to the fact that, generally speaking, he had no very great means for prosecuting a lawsuit after he got it, he had to give about half of it to some lawyer. On the other hand, the employer, as much as he might wish from altruistic reasons to assist an injured employee was always under the fear that to attempt to assist him was to invite a lawsuit, because there was always some lawyer who would see that an injured employee got a verdict out of proportion to his actual loss. Still further, the employer, whether he was guilty of negligence or not, had always to keep a corps of lawyers to defend him against suits that were brought. All told, it was about as unsatisfactory and unscientific a method of compensation for industrial accidents as can well be imagined.

The compensation law came with the idea of giving to an injured workman immediate relief, without the necessity of employing a lawyer, and giving it to him when he most needed it. I think I ought to say that experience has shown that this has not quite worked out in one respect as it should have. There is a provision in the compensation law by which an employer, if he has an industrial accident in his factory, may immediately, without waiting a single day, give his employee the money he needs for immediate treatment and for the support of his family, a most beneficial part of the compensation law which, I am afraid, is not used as much as it ought to be. A man who has his arm torn off, for instance, in a factory ought not to have to wait a day before financial relief is given him.

We have heard during the day a good deal about the comparative relationship of carelessness and ignorance of men and women, and the accidents which arise from defective machinery. There are, of course, two elements which conduce to industrial accidents. One of them has to do with the human equation which cannot always be controlled. Train a man as well as you please, instruct him as much as you like, and it is quite possible that he may be forgetful or careless either of himself or somebody else and a bad accident will happen from that. However, when you come to deal with the appliances with which men work, the machine itself is not subject to that sort of a limitation. A properly made, a properly repaired and a properly guarded machine never forgets to safeguard, and an improperly made, an improperly repaired and an improperly guarded machine never forgets to impair the safety of an employee.

We are to take up this afternoon more particularly the latter element as it has relation to industrial accidents—"Safe Practices in the Shop." Our first paper is to be by Mr. C. H. Norton, the Consulting Engineer of the Norton Grinding Company, of Worcester, Massachusetts.

THE HAZARD OF DEFECTIVE MACHINE TOOLS

By C. H. Norton, Consulting Engineer, Norton Grinding Company, Worcester, Massachusetts

Mr. Dunbar, our Assistant Engineer, was to have read a paper to you to-day, but he could not attend and he has asked me to read his paper with such additions as I might see fit to make. We were both very busy and haven't had much time to think about your meeting; bending all our efforts to designing and constructing great machines for expediting war work, and then right in the midst of these strenuous efforts having our cancellations come in as fast as the telegraph wires could bring them is at least not very conducive to writing papers. Mr. Dunbar has prepared a very brief paper which I will read.

"The Hazard of Defective Machine Tools"—It took us a little while to digest that subject and I don't know that we have fully done so yet. In our pride in our production we didn't think we had any defective machine tools that went out from us, and I hope there are very few, but I presume that our digest of the subject may be somewhere near right.

The treatment of this subject brings rather forcibly to the mind two facts: First, the point of view of the manufacturer of machine tools with reference to the safety question; second, the knowledge and the attitude of those responsible for the enactment and enforcement of safety regulations in an effort to reduce industrial hazard. To the mind of the manufacturer of reputable machine tools there need be no such thing as defective machine tools as they relate to industrial hazard. This gives us an opportunity to speak of the relationship of machine tools coming from those manufacturers who have had years of experience in their respective specific line, and those machine tools which are the outgrowth of the demand of the buying public either for a cheap machine or an intended copy of a standard make which could not be furnished by the standard maker due to unusual conditions.

Added to this there is another factor which introduces hazards, namely, those concerns which, because of lack of means or desire to purchase standard makes, contrive in their own works to supply their needs with makeshift machines.

We have passed through, in the past five years, a period in which the machine tool capacity of the country has been inadequate to meet the demand. This has given the opportunity for those who are inexperienced to undertake the manufacture of machine tools. We find that in the early years of the war certain industries engaged in the manufacture of machines entirely foreign to their experience. A foundry undertook to make lathes; a woolen factory tried to make grinding machines. Such cases have introduced hazards because of defective design and construction. We, who are manufacturers of machine tools, together with the support of those engaged in the enactment of regulations and the enforcement of rules for the protection of the worker, must give our attention to insure reasonable regulations to the end that reputable machinery may be protected, and those users who innocently or wilfully purchase and use the outlaw of the machine world will be prevented from subjecting their workmen to unnecessary hazards.

During the period covering the past ten years, rapid strides have been made by the old line manufacturers of machine tools who have recognized the need of the proper protection to the operator who is to use these machines. To-day there rarely exists in a machine coming from such a manufacturer the hazard which at one time was a common and unconsidered fact.

Right here I want to say that in the days when I was younger, our machinists took a great pride in being the whole thing. They didn't want gears covered up because they were inconvenient; they didn't want this and the other protection, and I will say that as a rule they steered clear of accidents, but there has been a great change in our industries. We have a great many people now running machine tools who do one thing over and over, who don't have exactly the mind or the will for initiative, and they cannot be trusted to protect themselves like the old-fashioned Yankee machinist used to. Therefore, our protection must be more secure.

Recognizing these conditions as they exist, the National Machine Tool Builders' Association and the National Metal Trades Association have formed an active committee, known as the Safety Committee (and our Mr. Dunbar is the Chairman), whose effort in this direction is given over to that line of education and missionary work which will bring before the public these facts. This committee's work is also connected with the various states who have active Safety Commissions, and whose attitude toward these questions rather than being one of destructive interest is one of constructive interest and effort to introduce safe, sane and reasonable regulations that the product of the reputable manufacturer, who has recognized the need for safety in his machines, may be protected.

It would be difficult now to find a standard make of machine tool in which safety provisions have not been introduced in compliance with such regulations as are in force and are known factors to-day in the various states. As those regulations become more and more numerous, I have no question but what even the machine tool makers will willingly bend their efforts to meet those regulations. It is true that in the past we have seen lathes in which the gears were not covered, and it is also true that on boring mills and radial drills, sometimes there are heavy weights suspended which perform certain functions in the operation of the machine, and are so suspended that should the suspension break the weight may fall on the hand or foot of the operator. Grinding machines will be found in which proper protection guards have not been supplied, but all these conditions are fast being remedied. The time has come when we must face the facts when designing machine tools. We must also realize that an inanimate machine, designed by experienced and competent engineers who have given years to the study of it, can hardly be blamed for accidents caused by ignorance or the improper installation or application of such a machine by the user. Our machine shops to-day, however, and our manufacturers are showing a very good record in regard to accidents.

As shown by the reports of the State of Massachusetts, there were, during the year 1915 in the State of Massachusetts, a total number of accidents reported under the compensation act of ninety-five thousand. That is a large figure, but when you hear the analysis of it, it seems a little better. Three hundred and seventy of these accidents were fatal; 938 resulted in crippling; 45,000 were scratches or bruises that caused no loss of time or wages. Of the 370 fatals, 95 occurred in our factories and 275 on the street, railroads and public service works. In comparison with this 370 fatality list, we have the figure of 374 persons who died of measles in the same period in Massachusetts. Figures seem to show that in all our factories, railroads, steel mills, and all kinds of industries in the United States, there is annually killed one out of every 1,500 workers. Outside of these industries, there is one out of every 1,000 workers. In manufacturing alone there is one out of every 4,000; in agriculture there is one out of 2,900. Is it not interesting to know that agriculture, one of the occupations that we have commonly looked upon as the simplest and having the least hazard, should have a ratio of 1 to 2,900, whereas in manufacturing, the occupation commonly understood to have the most hazards, there should be only 1 to 4,000?

I think we can explain that, and I know that every safety engineer here will be ready to jump right up and give the reason. I think the explanation that in manufacturing we have organized effort for safety, and, in agriculture we do not, is plausible. Ever since I can remember, in the factory there has been some one who has in some measure been studying the safety of employees, and in these days we have the thoroughly organized safety department making a study of these things which cause accidents. While the number of things that might cause accidents are more numerous around us than in agriculture, the effort to prevent their taking place is certainly more efficient. In agriculture, there is no such organization, and I think that must be the reason. It speaks well for the safety effort in the country.

Safety calls for care in designing machine tools. It calls for the education of the user. The last is borne out by the fact that 92 per cent of the accidents in Massachusetts were charged to carelessness and ignorance. Few, if any, of the best manufacturers of machine tools now sell defective ones. There should also be a campaign of education. In fact, one has been started and should be vigorously carried on, to the end that there be more co-operation of the younger safety engineers with the older and more experienced mechanical engineers to secure the benefit of such co-operation. The States of New York, New Jersey, Pennsylvania, Michigan and Wisconsin are in touch with the Machine Tool Committee representing mechanical engineers of long experience in connection with the safeguarding of machine tools, and this Committee stands ready to help the Commissions of these States, to the end that the machinery made by the members of the American Machine Tool Builders Association shall be as safe for the workman as it is possible to make it, realizing that each year will bring new demands and call for new effort.

Tradition stands in the way of making the old lines of machine tools as safe as they could be made. All mechanics here will recognize, of course, when

I say lathe, planer, boring mill, radial drill, etc., what I mean; there is a picture of those machines which comes into your minds, and I am afraid if you were an operator or a superintendent and you purchased a machine by that name and it had a radically different form, as an operator you would refuse to use it, as a superintendent you would ship it back to the maker. That stands in the way of much for safety. The designs of machine tools can't be just as we would like to have them. Commercial reasons are there. The designer has got to have it used when he ships it to its destination. He doesn't want it to come back. He has the whole world to buck. He has to respect tradition. He has to take every one of your minds into account. He can't do just as he would like to because you wouldn't use his machine. Take the old lathe we have used ever since our great-grandfathers in this country used them. They have been made in England for a hundred years and the form is very little different from what it was in the beginning. Like so many other things that we have got in this world, they have remained practically the same and the more people who used those things, the longer the same form will remain, because the more people you have to consult when you attempt to change them. It will be a happy time for a mechanical engineer when he can design a machine tool just as he wants to, but he knows better now; he thinks too much of his bread and butter. He knows that if he changes it and it gets out into the world, there will be a noise and the freight train will bring it back, so he has to feel his way carefully against your prejudices.

There have been changes — a little here and a little there in the course of ten or fifteen years. You notice that machine tools have changed their forms some, but not suddenly, only a little bit at a time. In the line in which we are engaged we are more fortunate, for the cylindrical grinding machine was absolutely new only thirty years ago, and the line that we manufacture was new only eighteen years ago. When you got that machine you had seen no other and didn't know the difference. You had to accept what you got; you hadn't anything to compare it with in your mind. I am glad to say that you did accept it, and accepted it cheerfully and voluminously, and we have enjoyed your acceptation. So we were enabled to make a cylindrical grinding machine that was comparatively safe, and I am proud to say that in almost nineteen years' experience with 8,000 large, heavy, cylindrical grinding machines spread over the world, we have yet to hear of the first accident caused by those machines. If we had been obliged to begin with something you all knew about, and had known about for generations, I don't know that we could have done it so thoroughly.

We have been enabled to prove that a guard over a cylindrical grinding machine wheel made of cast-iron in the proper way is safer than one made of steel, because we know it is solid and because we have made it stronger by 150 times, more or less, than the figures seem to show, and because the speaker and others stood up before them and tested them at abnormal speed before we would send them out to anybody in the world.

The maker of machine tools has other things to contend with in connection with safety. Operators will, in spite of us, use grinding machines for larger work than they were intended for and that work, in revolving, will come so close to something that has to be there that it may endanger the hands and fingers of an operator. We have had many a council, lasting hours at a time, as to what to do with that one feature, how to make it absolutely fool-proof. We haven't quite arrived there yet.

In hurriedly making machines for Liberty Motors, some one suggested that if they should sometimes use those for larger cranks an operator might reach his hand down, place it on the flat table and allow the crank to come around and crush his hand. The machines were ready to ship. Government represenatives were crying for cranks. The people wanted the machines and wanted them in a hurry. We hurriedly placed on the front of the label in a conspicuous place — "For safety, do not place work in this machine larger than so many inches." We are still at that problem, but it is a difficult one to solve. I find myself every day, in looking over a draftsman's table, suggesting that it is possible for a man to reach around somewhere or put his hand somewhere and get a finger cut or crushed. It seems to be my mission to goad the draftsman on to efforts more and more to avoid those things. I want to assure you that the machine tool people had to have that before them every minute, because machine tools are used for such a variety of shapes of pieces. It seems difficult to make a machine tool as absolutely fool-proof as I saw a punch press over here the other day. It seems more easy to make fool-proof those machines that do only one thing over and over. The machine tool must be open in order for the man to put work in there and he has a great variety of work to put in those tools.

I want to say a word to our safety engineers, and I hope, now, that you will take it in the spirit that I say it, or rather that I intend it.

I am past boyhood and I have had some serious experiences in mechanics, and I hope that the young safety engineer will not interpret what I say as any reflection upon the efforts of the safety organizations of our plants. Far from it! I, for one, was glad to receive them. I was glad to encourage them, and I hope they will grow rather than decrease, and I have frequently, through our own organization, co-operated with them and I wish I could co-operate more. But the young man somehow forgets the old fellow. He sails off alone; he doesn't know that the old fellow is around anywhere; and sometimes — not always — he gets into trouble when, if he had only asked a simple question of the old man, he might have saved some misunderstanding.

I know that in our plant our conditions are improving every month and every year, but once in a while we have something happen that I wish all of you would try and avoid, because it doesn't command respect for the safety engineer in the minds of the employees, and those are the people we really have to keep within our good graces, for after all, the greatest mission of the safety organization is to educate and guide the employee, because without his assistance nothing we do amounts to much. I want to cite just one incident that happened in our own plant. Most of you here know what a sensitive drill is. You know that the very word sensitive means that it has little force and little power, that it couldn't do much damage if it started after a man and chased him around the shop and grabbed him by the arm. It is a light little thing and can't do much harm. A man caught his sleeve in a little drill. It twisted up a little and made a small mark on his arm. His sleeve happened to be about half torn off before this happened. The safety engineer, (by the way, we have to report all those things) after that happened, tore the remainder of the sleeve off, placed it on the floor in a conspicuous position, painted the man's arm with iodine to make it look ugly, and took his photograph as a deadly warning against such carelessness.

Of course, our men all laughed at that because they knew they could lean up against that little drill and it would not do anything but tear a few threads in their sleeve. They all laughed at it and it didn't do any good. Our safety engineer didn't understand that that was not a dangerous machine. He thought it was and that the mere fact that this man didn't get hurt was just luck. Our employees knew better than that and made fun of him. Avoid those things. Don't try to make a bug-bear out of something that isn't really dangerous. There is enough that is dangerous.

I hope that the safety engineer will co-operate with the mechanical engineer more than he has done, not keeping his department so aloof, not closing the door on his stenographer and spending too much time tabulating and alphabetically listing certain typewritten forms and formulas, but getting out and going about the works, getting in touch with the old man, getting acquainted with him, finding out that he is not a lion with long teeth but that he is just an ordinary good-natured man who has had some experience and would like very much to talk it over with you in order to help you.

GENERAL DISCUSSION

Commissioner Lyon: Now, let's have discussion of Mr. Norton's paper.

Mr. Charles Basner, Factory Inspector, New York Industrial Commission: The last speaker stated that tradition was the reason why machines were not guarded by the manufacturer. I think he is wrong. I may be wrong myself, of course. The real reason for the condition that exists in not guarding machines is competition, not tradition. We know that every fellow wants to make a machine and sell it cheaper than anybody else so he can get the business. If you make a machine and leave off the guards, you are saving a little money on material and you are saving a little labor; you can sell your machine cheaper than the other fellow, that is, the fellow that makes his machine with guards. Naturally, the fellow who makes the machine with guards after a while gets to feel that he is not getting enough business and he may leave off the guards. I think the best way to get those machines guarded would be to have proper legislation so as to force the manufacturers to make their machines and have them guarded in the factory. I will give you an instance where a certain factory could have saved themselves a lot of trouble.

One of our women inspectors went into a factory where they manufacture hotel supplies, and in that factory there was an electric machine. She saw that when the machine was working big sparks flew off and hit the man operating the machine. The man stated that if a spark like that ever hit him in the eye, it would ruin his eye. She filed an order to have that electric machine guarded. The people wrote a long letter to the department and said, "We can't guard that; there is no machine like that on the market that is guarded. Send somebody down to show us how." The Supervisor gave the letter to me and said, "Go down and see these people." I went and looked at the machine and found it was a dangerous machine. I studied the problem and after a while I said, "I'll tell you what you do. You have a cone made out of isinglass and have it slide up and down on a wire or something like that, or a cylindrical steel rod, and you can adjust that to your work. When the sparks fly off they will hit the cup and drop down instead of hitting the man." The superintendent said, "That is a good idea. I'll do that." I said, "I'll give you a week's time to do it." In a week I came around and the guard wasn't there. I said, "Why didn't you guard that machine?" He said, "We found it would be impractical and we are not going to do it. If you want us to guard that machine, you might as well shut it up altogether." I turned around and said, "Well, if you feel that way about it, we'll shut it off." I took out a tag and started to tag up the machine. Then he said, "Oh, wait a minute. We'll give your idea a try-out." I said, "All right; we'll give you a little more time." A week later he finally put the contrivance on and it worked wonderfully.

Legislation is the thing we need, and I think it will work out better than anything else in making the manufacturers of machines put guards on them before they sell them.

MR. H. G. MEACHAM, Goulds Manufacturing Company, Seneca Falls: As a man who is young in the safety engineering work, I want to thank Mr. Norton for the closing remarks he made in regard to getting in touch with the old employee on the job before guarding a machine. It would be just as foolish for a mechanic to come into an office and tell an office man how to file his mail, or conduct his card index system, as it would be for an office man to go into the shop and tell a mechanic how to guard a machine when the office man knows nothing about it. If you go to the old employee and get his ideas on how to guard the machine that needs to be guarded, you will have accomplished two things — you have guarded the machine as it should be guarded and you have gained a booster for the safety movement.

MR. L. A. HAVENS, Chief Factory Inspector, New York Industrial Commission: I would like to ask Mr. Norton to give us a little more history. He has stated a fact here this afternoon which, I suppose, is a historical fact, and I believe we all would be interested in having him speak a little further, if he will, on the origin of the cylindrical grinding wheel. Whether I have misunderstood him or not I don't know, but my understanding was that in the last eighteen years your product has come out and that the cylindrical grinding wheel itself was absolutely new in the last thirty years. I am wondering if Mr. Norton intended to include with that the cylindrical grindstone that we used to break our backs over as small boys, grinding knives, sickles and things of that kind, and if he intends to include also the emery wheels that we used to watch, to my knowledge, through the window of a machine shop and see the sparks fly. I believe a little further information along those lines would be interesting to all of us if Mr. Norton would give it.

MR. NORTON: There is a chance for a little misunderstanding. This is Mr. Norton of the Norton Grinding *Machine*, not Mr. Norton of the Norton Grinding *Wheel* business. He died a great many years ago; he was no relative of mine; it is just a coincidence that Mr. Norton, of the Norton Grinding Wheel business happened to have the name of Norton, the same as Norton of the Grinding Machine business. We had two corporations side by side; we had the same financial head and backing, but we each worked independently of the other.

I spoke of the cylindrical grinding machine. Thirty years ago the cylindrical grinding machine (I should have qualified that statement) was put in the form of a machine tool for use in general by Mr. Brown, of J. R. Brown and Sharpe, and as an engineer of the Brown and Sharpe Manufacturing Company thirty years ago, I began that work.

The vitrified grinding wheel, as you know it, is about fifty years old. The grindstone, of course, is older than you or me.

MR. WILLIAM NEWELL, Chief Safety Engineer, State Insurance Fund: I would like to ask Mr. Norton what he thinks the attitude of the manufacturers would be toward legislation compelling them to install built in guards on machines before they were sold.

MR. NORTON: We wouldn't want you to make a law to compel us to do something that was unreasonable. It depends upon who the representatives in the Legislature are.

We have a law in Massachusetts, or did have the last I knew (we change things so rapidly there that we can't keep up with them), that said that all shafting and all belts in all factories must be entirely enclosed. We don't want any of that stuff because you know we couldn't use them if they were that way. We are sometimes misunderstood when we put things that way. People who don't understand the technical things get an idea that if we pass a law like that, that all shafting and all belts must be entirely enclosed, they think we are making progress, but, of course, you all know that if that was literally true, there wouldn't be a factory running in Massachusetts. It would be impossible. There are some things that can't be done, but they are few compared with the whole. We can do a whole lot and we will be glad to do it, but our Machine Tool Committee is in existence to-day to try and steer people out of foolish legislation into something that is practical.

COMMISSIONER LYON: Wouldn't this help the matter somewhat? If our Inspection Rating Boards were really to rate according to inspection and experience, so that a man's safety in his factory were immediately reflected in the expense of his compensation, wouldn't that put a good many guards on machinery?

MR. NORTON: I would like to say one more thing. There is a selfish reason why we all, as manufacturers, want to guard our machines; that is the compensation act. We are insured to be sure; most of us get a rebate; if we don't do any harm we get a rebate. Now, we are looking out for the rebate, and we are going to guard the machines from the humanitarian side, but for selfish reasons as well. There is every reason why we should guard our machines all we can, and we are ready to receive all the suggestions you have.

COMMISSIONER LYON: Is there any further discussion?

Our next speaker is to talk to us on "Head and Eye Protection." Mr. William Newell, Chief Safety Engineer, of the New York State Insurance Fund.

HEAD AND EYE PROTECTION

BY WILLIAM NEWELL, CHIEF SAFETY ENGINEER, NEW YORK STATE INSURANCE FUND

Ladies and Gentlemen: In order to keep this paper within bounds, it has been found necessary to confine it to the subject of mechanical injury to the head and eyes, including injuries due to unusual glare or heat. No reference is made, therefore, to devices worn on the head or nose to prevent the inhalation of injurious gases, fumes or dust. Such devices would properly come under the heading of "Lung Protection" rather than "Head Protection."

Aside from the humanitarian aspect of the matter, the financial loss alone is so great that the prevention of injuries will pay big dividends to both employer and employee. In addition to the direct loss of compensation payments by the employer, there is also the indirect loss due to delays, spoiled work and interruptions. A new man must be trained to fill the vacant position, and every accident serves to lower the efficiency of the working force.

The National Committee for the Prevention of Blindness has compiled statistics of injuries taken from accident reports of seventeen states. The reports do not coincide so far as dates are concerned. They give, however, the statistics for the latest twelve months' period on which data are available and show that for the latest respective fiscal years reported to June, 1917, there are reported 710,571 industrial accidents. Of this total there have been reported 59,436 eye accidents, or about eight and three-tenths per cent, out of a total of one-third of all non-fatal accidents occurring annually in the United States.

From the data compiled the above-named Committee concludes first: Of the 2,000,000 non-fatal accidents, probably 200,000 are accidents to the eyes, or about 10 per cent. Second: Approximately 15,000 persons in the United States are blind to-day as the result of accidental injury in industrial occupations. Third: The maintenance of these blinded artisans, during the remainder of their lives, will cost nearly $10,000,000, which expense will fall in large part on relatives, communities or states. Fourth: The actual economic loss cannot be estimated, and the loss to the unfortunate person whose eyesight is destroyed is least of all a matter of dollars and cents.

It has not been possible to ascertain the total annual award in compensation payments to those who have suffered industrial accidents in the United States, nor can the total loss of time from the injuries sustained be determined.

Some figures for the states of New York and Washington are of interest, however. In the year ended June 30, 1915, there were in the entire state of New York 887 eye injuries for which compensation was paid under the compensation law. These included 543 cases in which the injuries were only temporary. There were 303 cases in which there were permanent injuries to the eye-sight, in 301 of which there was loss of one eye. There were 400 cases in which the injuries, besides being permanent to the eyesight, were sufficient to cause permanent total disability. In the other two cases the injuries finally resulted in death. The total amount of compensation for these 887 cases was $484,234. Of this amount only $24,514 was for temporary injuries. In the two death cases the compensation amounted to $9,520. This leaves for the 342 cases of permanent injuries total compensation of $450,200. For the year ending September 30, 1917, the State of Washington reports 751 eye injuries, involving 11,829 days' time lost and compensation payments of $103,048, or nearly 10 per cent of the total compensation paid for that year, which amounted to $1,185,310.

It has been demonstrated in recent years that most industrial eye accidents can be prevented by wearing proper protection over the eyes or face. To cite only one illustration — the American Steel Foundries Company collected 287 pairs of goggles broken in service in six months. Only three eyes were lost in twenty-seven months by workmen to whom goggles had been furnished, only one of which was lost due to a piece of steel penetrating the lens, which was a case when the velocity of that particle was so great that it would have gone through anything that it would have been practicable for the workmen to wear. Goggles were not being worn at the time in the other two cases. Such protection may often be supplemented to advantage by the use of screens placed about machines or chipping benches, which will protect not only the worker but also those passing by or working near him. Small screens made of leather, rubber, metal, or heavy glass in a metal frame may often be attached to a machine so as to prevent chips and cuttings from flying from the tool.

The nature of the work to be performed will determine the kind of protection necessary. In some instances the face as well as the eyes must be protected. In others shields or screens are sufficient. In a majority of industrial operations, however, goggles will give the maximum protection practicable if they are properly constructed and adjusted. The use of goggles with additional head protection in certain cases should be required of men engaged in the following classes of work: Chipping metals, concrete, brick, stone, etc., including chipping scale from boiler drums, riveting, grinding on emery wheels and grindstones, including dressing the wheels, machining tool steel, cast iron and brass when not using a chip guard, turning on wood lathes, sand-blasting, pouring molten metals, including Babbitt metal, oxyacetylene welding and cutting, electric arc welding, work on electric switches and putting in fuses, (it is unnecessary, of course, to state that closed fuses should preferably always be used) soldering electrical joints, blowing out generators and motors, cleaning arc lamps, replacing gage glasses on boilers, dumping ashes, cleaning under boilers, breaking coal, unloading coal from cars, painting stacks, whitewashing, dismantling buildings, occupations in which there is exposure to irritating and poisonous dusts, fumes and gases, the chemical industries and work involving the handling of acids and chemicals, and metallurgical operations where there is great exposure to intense light and heat. In the last named occupation, as well as in the welding and cutting operations referred to above, the goggle lenses should be of the proper color to shut out the destructive rays. Different types of goggles are made for different classes of work. The different types in use may be classed under four heads as follows: First, goggles for protection against flying materials, including molten metal; second, goggles to protect eyes against injurious light or heat rays; third, goggles for protection against gases, fumes and liquids; fourth, goggles to protect the eyes against dust and wind. Goggles to protect the eyes from flying objects and molten metal should be provided with strong lenses made from tough, thick glass which will stand a heavy blow without breaking.

The lenses are held in flanged rims so that even if the lenses are cracked, the glass will not readily come out. Lenses should be removable in order that they may be replaced with new ones when damaged. It is not desirable that they shall be too easily removable, however, as this may lead to the workman or some unauthorized person replacing the lenses with sub-standard lenses. Side-screens or shields are necessary, and the eye-cups should be so constructed that flying particles cannot get into the eyes through spaces over the nose piece or around the eye-cups.

Goggles to protect eyes against injurious ultra-violet rays and infra-red heat rays should be provided with colored lenses, the color varying with the kind of work for which they are to be used. The color should be selected by a competent oculist and the lenses secured from a manufacturer specializing in lenses for this purpose. It has been found that smoked and blue glasses frequently used are transparent to the very rays it is necessary to eliminate and their use not only is incorrect but in some cases involves great danger. If the eye is exposed from two to three minutes to the direct rays of the heat employed in the electric welding process, which generates a temperature from 6,200 to 6,450 degrees F., the eye will be totally destroyed.

In electric welding operations the lenses should be set in a helmet which will also protect the head and neck from the heat rays which otherwise would cause face burns.

Goggles for protecting eyes from gas fumes or liquids should be tight-fitting and should be provided with rubber mountings or padded eye-cups which conform closely to the contour of the face. The General Chemical Company furnishes its employees working on acid pipe lines with a rubberized cloth hood with mica covered eye openings to be worn whenever they are loosening or tightening valves or separating flanges, to guard against a sudden squirt of acid which might strike them in the face and eyes.

Goggles for protection from dust and wind are required only to be comfortable, tight-fitting and light in weight. When used in industrial processes, they should be furnished with lenses of clear white or lightly tinted optical glass free from imperfections.

All types of goggles must be made comfortable or they will not be worn. This can be accomplished by taking care to secure a correct fit, as no two faces are shaped exactly alike. Employees who should wear goggles and who are accustomed to wearing spectacles with corrective lenses should wear goggles provided with lenses ground from the same prescription. If this is not done, they should wear goggles with frames large enough to fit over their spectacles.

Goggles should not be changed among employees unless thoroughly sterilized because of the danger of spreading infectious diseases. Each employee should be provided with a cloth to clean his goggles, the cloth being renewed frequently. In case of goggle lenses becoming steamed up, the use of glycerine pencils, known as anti-sweat pencils, or crayons, may be used to clean lenses and prevent formation of moisture for several hours. Finally, in case of any foreign body getting into the eye, it should be removed only by a physician or some one who has had proper training and experience. Under no circumstances should workmen attempt this dangerous operation, as in such case the eye will probably be injured or infection will follow.

In closing, it will be of interest to employers to know that the Compensation Inspection Rating Board grants a credit of two per cent of the manual insurance rate in classification involving an appreciable amount of work creating an eye hazard, where all workmen requiring eye protectors are furnished with eye protectors (which comply with the published Rating Board Standards) and use same.

GENERAL DISCUSSION

COMMISSIONER LYON: Those of us who have to do with compensation find it one of the most difficult things in the world to arrange compensation and deal with the man who has what some of us call three eyes. A man gets an injury to one eye and has it operated upon, proper glasses fitted to it and the eye is perfectly good, but it will not work with the other eye, so that for all practical purposes the eye which has been treated is worthless. Shall you pay him for that eye, although he has a good eye that won't work with the other?

Suppose he loses the good eye. Then the eye you have treated, which would not work with the other eye, comes back into use and you have got a good eye. Consequently the man has lost two eyes, been paid for them and got one left. It is rather ludicrous, but the Supreme Court is wrestling with that now. The Court seems to have gone both ways on that. One decision claimed that he had not lost his eye and the last one was that he had lost his eye. If he has, what are you going to do when the bad eye comes back again?

MR. D. S. BEYER, Liberty Mutual Insurance Company, Boston, Mass.: Mr. Newell has covered the subject quite thoroughly. One point which he mentioned was that of the American Steel Foundries Company, which has made one of the best records, I think, along this line that we know anything about. They apparently overcame the difficulty of getting men to wear their goggles. I believe Mr. Cameron, General Manager of the National Safety Council, who is with us today, was in charge of the plants of the American Steel Foundries Company at the time the record Mr. Newell mentioned was made. I wonder if Mr. Cameron would tell us something of the methods he used.

MR. W. H. CAMERON, General Manager, National Safety Council, Chicago, Ill.: Ladies and Gentlemen: I think I found, when I started back in 1910, that there were few companies using safety goggles. We had a meeting of our managers, and they were very much opposed to the introduction of the subject. They told me that goggles had been worn in the plants for twenty-five or thirty years, or that they had been introduced that long ago, but no effort had been made to enforce their use, they had not been worn and no effort had been made to find a satisfactory goggle or kind of goggle.

After a while I got one manager in our plant to try out the goggles in one department for two weeks. I went to one of the optical companies and got some one to fit the goggles. It was simply a matter of persistence in demonstrating to each one of the plants and departments that the safety goggles were desirable to be used.

Perhaps you will remember, some of you, seeing a picture that I took, showing one hundred pairs of safety goggles that had been more or less destroyed in use. It is the practical thing to use the safety goggles and they are necessary in industrial work.

MR. N. B. LUDLUM, Safety Manager, Lackawanna Steel Company, Buffalo: I can't recommend too heartily the use of goggles in the various plants. I believe this must be worked out by the safety engineer of each individual plant through his management and through his foremen. I believe that work must be done by the safety engineer entirely through his foremen. I don't believe a safety inspector ever gained anything by telling a workman the seriousness of the condition of a fellow workman who worked in some other part of the plant and lost his eye. I think that is lost on most industrial workers, but if you take the foreman right by the neck and tell him that he is going to do one of two things, make his men wear goggles or make room for some one else, you will get somewhere. We use in our plant among some 8,500 or 9,000 men about 2,000 or 2,500 pairs of goggles, most of which are in use constantly. The balance are used at intervals when the men have chipping to do.

I have experienced a good deal of trouble and have put in a good deal of work and time on this, and I don't believe I could describe to you the methods I have used in getting the men to wear goggles.

In one of our shops where we have six or eight chippers, I told the foreman that every time I went through I found one or two of his men not using goggles and chips flying around promiscuously. He said that he couldn't make those men wear goggles and asked what he could do. It is a poor argument to come to a safety inspector and say, "What will I do?" It is an earmark of rather poor form to a foreman who doesn't know his men. I told Mr. Foreman to get busy and find out what to do. He said, "But I don't know what to do." I said, "If you want something from me, I'll tell you what I'm going to do. I'll give you fifteen pairs of goggles this morning. Every pay-day, or two or three days before, I'm coming around to see how many pairs are being used, and I'm going to deduct a dollar from your pay envelope for every pair of goggles you are short." He had told me that some of the men took their goggles home. Well, when I told him that, his language wasn't such that I could repeat it here.

He said, "If you are going to do anything like that, then I'll tell you what I am going to do. I am going to build a little cabinet with pigeon-holes in it for every pair of goggles, and as I give the goggles out to the men, I am going to take their brass checks away from them during the day. When they go home at night they can't get out without those brass checks." I said, "Well, you have worked your system out already and saved yourself several dollars."

If you will get your foreman in and tell him that he must in some way make his men use their goggles, he will do it.

MRS. J. D. GANOUNG, U. S. Employment Service, Olean, N. Y.: We put a woman in charge of the goggles, and the men are wearing the goggles. They said, "We have been willing to wear them all the time," but they just hadn't been compelled to do it and they neglected it and were careless about it. When they knew they had to come to time, they wore them all right.

MR. L. A. HAVENS: Mr. Chairman, I'd like to add just a little bit to what Mr. Newell has said in relation to the prevention of steam on goggles. He has mentioned the use of the glycerine pencil. Those are not always available, and there are a great many times when it may be necessary to use goggles in an emergency, and you have not time to look around for a glycerine pencil. Anything that will grease the glasses and can be wiped off will serve the same purpose. If a little piece of paraffin or tallow or a chunk of candle is rubbed over the glasses and wiped off apparently clean, there will be enough grease remaining on the glass to prevent steam accumulating.

MR. BRISLEY, International Harvester Company: After a man has suffered the loss of an eye, what protection do you give? Do you furnish protective goggles with a ground lens or no lens at all, if the eye is completely gone, to give him adequate protection for the other eye? Has anybody had that experience?

MR. LUDLUM: The Lackawanna Steel Company furnishes the workman with a special pair of goggles with a special lens to cover the good eye, with a parallel lens to cover the blind eye. We stand the expense of the examination and the prescription. If he breaks them, we supply the new lens. We tell him that if we find him in any part of our works once without them, he is through. We find that we have no trouble in getting these men to wear goggles.

MR. NORTON: In regard to that situation, we have never lost an eye in our works yet, but we employ men who have but one eye. We do not put them at any employment whatever where there is the slightest danger of their losing the other eye. They have employment in which they are reasonably sure of not losing the other eye.

MISS HARRIET M. MILLER, Syracuse: I would like to ask about the accidents in outdoor occupations, for instance, railroad engineers and firemen or marble cutters.

MR. NEWELL: I am sorry that I have not run across any statistics that would enable me to answer your question. I did find some statistics on agricultural occupations, however, which showed that the percentage of eye accidents in agricultural operations was relatively higher than those in industrial operations which, perhaps, is in line with what Mr. Norton told you about one accident per 2,900 in agricultural operations and one in 4,000 in industrial. I think perhaps the eye accidents will follow about the same ratio.

MR. H. G. MEACHAM: I would like to ask the gentleman from the Lackawanna Steel Company, or anybody else who can answer the question, what they do to provide goggles for a man who needs corrective lenses. For example, a man's eyes are bad and he can't see well without glasses and his employment is such that it requires the use of goggles.

MR. LUDLUM: We furnish him with a corrective lens. We take the glasses that he uses for ordinary purposes and have the lenses made up from them. Among our 8,500 men we have very few such cases. We don't have our men's eyes examined nor provide those with glasses who have never worn glasses, but we do furnish those men who wear glasses and need goggles with corrective lenses if they are necessary.

Commissioner Lyon: Mr. Ludlum, I'd like to ask you a question about that. Do you find, in your experience, that you save enough on your compensation to pay for the care you use in selecting glasses?

Mr. Ludlum: Now you want me to brag about myself. I was going to tell you something along that line. Then I thought of several remarks other people made about themselves and I refrained.

Since the war emergency started, we have had a great many chippers using pneumatic tools, I should say 500 to 1,000, the other men who were chipping with pneumatic tools prior to that time continuing right on, and there were probably 1,500 men using pneumatic tools. We have hand chippers and many other occupations which are extremely hazardous to the eye, and without hesitation I tell you that in four years we haven't had one eye injury to those men — not one, but I go so far in some departments as to require an exact report from each foreman of the names and check numbers of the men he has asked to use or compelled to use their goggles during the week. Sometimes I find those reports are not correct, and I presume many reports which I am not able to check up are not correct. However, I get around once in a while and just get the check number of a young fellow who doesn't put his goggles on. I don't say anything about it until the report comes in. Then if this fellow's number doesn't appear on the report, I send for the foreman, and if the ladies will step out, I'll tell you what we say to that foreman.

In that way we are able to tell how things are going and to check up on the men who fail to use their goggles. Our great trouble is with the men who just chip for a minute or two at a time two or three times a day. Our last eye case several months ago was an engineer on one of our large engines who picked up a sledge and hit a six-inch nut in order to loosen it so he could unscrew it with a wrench. He hit it a second blow and a chip came off and hit him in the eye. We are unable to go so far as to compel men to put on a pair of goggles when they are going to strike a nut with a hammer. Those are the eye accidents which we are having now and all the eye accidents we are having at this time.

Mr. B. W. Nutt, Strong, Kennard & Nutt Co., New York City: I just want to say a word in reference to fitting corrective lenses to men wearing goggles. There is a point which comes up in this discussion — the increased efficiency of men with goggles.

I was going through a plant one time inspecting men who were doing some grinding. I was informed that one man was going to be let out the next week because he was slow in his work. I decided, after inspecting the situation, that the trouble with that man was probably not due to his own fault but to his poor vision. I suggested to the safety man that he have this man's eyes examined and a pair of goggles fitted to him with corrective lenses. A week or two later I was out at the plant and they took me out to see this man. He was a foreigner about fifty years old who had never worn glasses in his life. They told me the man was very near-sighted and had always been so from childhood. He couldn't talk English, but he was very eloquent with his hands when they told him I had furnished the lenses for him, or that I had recommended that they furnish the lenses for his goggles. It was really pitiful. When he found out it was possible to see as well as he could after he had his glasses, he was just full of gratitude to his employers.

The point is not only that you help to prevent accidents, but you greatly increase the efficiency of the men who have defective sight when you furnish corrective lenses in their work. If a man has to have corrective lenses, put his corrective lenses in his goggles, but if he has to have glasses also, see that those are provided. No man around a plant is a safe man who hasn't good vision. Besides that he isn't an efficient workman.

The plants of the Goodrich Company at Akron test the eyes of practically everybody who comes into the plant and office. They found that about 20 or 25 per cent of the people they tested should be wearing glasses and that they couldn't do efficient work without them. They require that those people who need glasses have them before they go to work. They so greatly increase the efficiency that no amount of cost which might be put upon them is to be considered. I think this is a thing that is coming up with most employers sooner or later.

COMMISSIONER LYON: Get this to every employer if you can — not only that it is human to want to keep eye-sight in his employees, but that it pays better to save an eye than to pay for it after it is lost.

MR. LUDLUM: I just want to say that at the Lackawanna plant our situation is well taken care of by the examination which each employee undergoes before he starts to work. If we find a man with seriously defective sight, we tell him to get glasses before we employ him. We do not take that expense. But if his work is to be hazardous, we provide him with corrective lenses.

COMMISSIONER LYON: We will now listen to the last speaker of the afternoon — Mr. Peter C. Spence — on "Machinery Layouts and Their Relation to Safety." Mr. Spence is the Mechanical Engineer of the State Industrial Commission of New York.

MACHINERY LAY-OUTS AND THEIR RELATION TO SAFETY

BY PETER C. SPENCE, MECHANICAL ENGINEER, NEW YORK INDUSTRIAL COMMISSION

Mr. Chairman, Ladies and Gentlement: To have his machinery laid out so as to insure economy in production and in addition to be safe for his employees is of paramount importance to the manufacturer. It is reasonable to assume that if the manufacturer cannot conduct his factory profitably, there will be no employees and no machinery to make safe. It is a welcome sign that the times have advanced so that the slogan is no longer "Safety First" but has changed to "Safety Always."

The waste of productive power through suspension from labor by the injured, destruction of machinery, stock and spoiled materials, loss of normal production, increased cost of insurance premiums determined by compensation awards, accumulated loss of mechanical skill through injury, increase in cost of turnover, loss of revenue from idle investment during the period of disability, and the tug on the heart-strings when learning of real suffering by the injured and dependents add to the manufacturer's interest in suggestions which aim at eliminating accidents wherever they can be foreseen or prevented.

According to the report of the Statistician of the State Industrial Commission, there were 39,622 compensated accidents in this state during the year ending June, 1915, for which the total compensation amounted to $7,145,216.30. Of this number of casualties there were 854 deaths. Including prime movers, excluding machinery on farms, injuries caused by excavation and construction machinery and work not done in a factory, there were 6,279 compensated accidents, for which compensation amounted to $1,077,774.12 was awarded, so that in number of cases and amount of compensation, machinery stands debited, from this record, with 15 to 16 per cent of the casualties.

There were elevator accidents, accidents in mines, tunnels and excavations, from pleasure machines, boats and cars, from explosions of various substances, burns and deaths due to various gases, liquids, molten metals and inflammable materials, conflagrations, stumbling, slipping, falls, falling and flying objects, accidents due to the collapse of buildings, walls, scaffolds, stagings, ladders, chutes, etc., stored or piled up materials so as to cause injuries and deaths, from the slide or fall of grains, from nails, tools and other sharp objects, from animals, lightning, heat and frost, from drowning, intentional violence, etc. Many of these occurred in factories, but the lay-out of machinery had little or no relation to them. Nevertheless, it was the human machines — the workingmen — who were injured. Accidents are defined as coming from an unknown or unexpected cause, and such can never be eliminated, but industrial injuries can and should be reduced to a minimum.

A structurally safe factory building should be the primary consideration, for in some industries the location and relative situation of the building itself is an important factor in the manufacturing process. The state of New York, which legislates about almost everything else, has never placed a standardized building code upon its statute books. It is true that some cities and municipalities have adopted building laws and ordinances, but outside of the territory over which the local officials have jurisdiction, factory construction is left to the judgment of the individual who designs the structure. If the floor beams, girders, columns, walls, footings, foundations, or soil is overloaded, or is stressed beyond the ultimate or even safe sustaining capacity, laying out the machinery properly could in no way offset nor mitigate the horror of a collapse due to structural insufficiencies, or inherent weakness in the building.

The amount of load that can be safely carried or supported on each square foot of floor area should be determined and conspicuously stenciled or posted on the various floors. Machinery should be spread over sufficient floor area by means of skids or platforms, so that its weight, together with the added weight of the stock, if that be a factor, would not exceed the posted unit floor carrying capacity, multiplied by the supporting area in square feet. Running machinery should be considered as increasing the live load in proportion to the degree of vibratory impulse transmitted to the floor. Should the load be a moving one, and the floor can safely sustain a static load of 120 pounds per square foot of floor area, it would be safe to superimpose no more than 60 pounds upon each square foot. Considerable vibration transmitted to the brick walls by the floor beams and girder ends has a tendency to break the bond in the brick work, which would render the building unsafe and make a collapse imminent. This is all the more true if the beam ends be not beveled as most building codes now require. Machines that transmit considerable vibration to supporting members are usually hung or supported from roof trusses and kept clear of the floor construction.

As a rule, the machinery in a shop should be laid out in groups, according to their functions, and the raw material should follow a more or less straight course in its progress of manufacture. It is a poor arrangement when work zig zags up and down, back and forth, through a shop. The path of least length of travel will prove industrially more efficient, and the longer the route, all other conditions being equal, the greater the risk of accident. With heavy castings it can be readily understood that the less handling the safer the work. However, this theory cannot always be strictly adhered to in practice. Competition will force a manufacturer to do his work at the minimum of expense, and thus will locate any job where the best skill for that particular operation exists in the shop, or else the job might be routed by the planning department to that group of machines best able to bear the mechanical burden at that particular time.

Section 85 of the Labor Law provides that each employee working between the hours of six in the morning and six in the evening shall have at least 250 cubic feet of air space, and 400 cubic feet of air space when working between the hours of six in the evening and six in the morning. Assuming the ceiling height to be ten feet, this law allows a minimum of 25 square feet of floor space for each day worker and 40 square feet of floor space for each night worker. While it is true that conservation of floor space is oftentimes a necessity, and it can be figured that the greater the number of machines, allowing for each machine its potential maximum output, the greater will be the total of production, the opposite may be the practical result, if machinery and aisles are so crowded that workmen interfere with one another and jeopardize each others safety. A slight push, under some circumstances, will cause a workman to lose his balance, fall against moving machinery and get hurt. I need not tell some of the people in this audience what a little " pull " can do.

Laying out the machines too close together is a very dangerous practice when long pieces of bar stock are being tooled, and the damage is very much greater if the bars revolve. Not only may the material jab a neighboring workman with injurious effect, but shoved into the gears of an adjoining machine when operating, the field of damage and danger would be very much extended. Narrow aisles and crowded machines do not allow the stock and finished product to be piled up in an orderly manner. Individual racks for the piling and storing of stock and finished product have proved their worth in shop management. Stacking the stock and work around the machines on the floor and using a procession of helpers to fetch and carry is neither orderly nor economical, and what is worse, it adds to the tripping and stumbling hazard.

Aisles too narrow for trucks to pass freely either crowd the truckmen against machines which may be running, or they jostle one another, bruising or lacerating their knuckles, if the results be not more fatal. The spilled material, confusion and disorder resulting from colliding trucks, with consequent loss of time in retrieving, is demoralizing for shop management.

Since it stresses the structural members of a building least when machinery and other loads are placed over girders near columns, and near bearing walls, care should be taken to always allow sufficient room between these obstructions and the machines to permit of cleaning, adjustment and repairs, and particularly should care be taken to allow for clearance if the machine has a traveling carriage.

Plotting a scale on pieces of cardboard of the floor dimensions of each machine, the amount of room required by each operator and allowing for the area of his operations, so as to permit him to produce his maximum, and arranging these cardboard pieces to the best advantage for machine grouping and work routing on a scale plan of the shop floor, is a helpful method of laying out machinery for production and safety.

The Travelers' Insurance Indemnity Company, of Hartford, Connecticut, recommends that the width of a trucking aisle be the width of the truck plus 18 inches. If there are no operators standing back to the aisle, or if the operators are standing back to the aisle on one side, 18 inches should be added; if operators are standing back to the aisle on both sides, 36 inches should be added. Of course, if a double line of trucks is used, the aisle should be wider by the width of at least a truck plus some clearance which I take it is 9 inches. When an aisle is not used for trucking, its initial width should be a minimum of 30 inches and an additional 18 or 36 inches should be added, depending on whether or not operators of machines are standing back to one side or both sides of the aisles. If a machine is placed so that when the operator is facing the machine his side abuts the aisle and not his back or face, no additional space need be added, but the space to be allowed between machines parallel with the aisles should be determined by the type of machine and the nature of the material that must be run through it.

Section 79-c, subdivision 3 of the Labor Law provides: "There shall at all times be maintained continuous, safe, unobstructed passageways on each floor of the building, with an unobstructed width of at least three feet throughout their length, leading directly to every means of egress, including outside fire escapes and passenger elevators. All means of egress shall be maintained in an unobstructed condition."

In connection with this subject of aisles, it is interesting to consider the proposed rules and regulations which were formulated by the late Industrial Board of the Department of Labor, but were never formally adopted.

> The term "main aisles" shall be construed to mean passageways leading directly to every means of egress; the term "tributary aisles" snall be construed to mean passageways leading to or opening on main aisles.
>
> The measurements required in the following rules shall in every case be taken from the outermost projection of machines, machine tables, walls, partitions, tables, or other fixed obstructions, except seats of any kind.
>
> Requirements for aisles in which persons are employed standing shall apply only when no seats of any kind are provided in the aisles.
>
> *Rule One:*
>
> I. Main aisles where a single row of persons is employed:
>   (a) Seated — four and one-half feet.
>   (b) Standing — three feet.

II. Main aisles where a double row of persons is employed:
 (a) Seated — six feet.
 (b) Standing — four feet.

III. Tributary aisles where a single row of persons is employed:
 (a) Seated.

1. If any such aisle has a single outlet, it shall be thirty-six inches wide, but if any person has to travel more than thirty feet to the nearest tributary or main aisle, it shall be forty inches wide.

2. If any such aisle has two outlets, it shall be thirty-six inches wide, but if any person has to travel more than forty feet to the nearest tributary or main aisle, it shall be forty inches wide.

 (b) Standing — twenty-two inches.

IV. Tributary aisles where a double row of persons is employed:
 (a) Seated.

1. If any such aisle has a single outlet, it shall be five and one-half feet wide, but if any person has to travel more than thirty feet to the nearest *main* aisle, it shall be six feet wide.

2. If any such aisle has two outlets, it shall be five and one-half feet wide, but if any person has to travel more than forty feet to the nearest *main* aisle, it shall be six feet wide.

 (b) Standing — three feet.

Rule Two:

The width of all such aisles mentioned in Rule One shall be unobstructed and so maintained at all times. Chairs, stools, benches, or other seats, shall not be deemed obstructions for the purpose of this rule; and also bins or receptacles shall not be deemed obstructions to such aisles if they project not more than twelve inches from the table or machine.

Rule Three:

All tributary aisles more than forty feet in length shall have two outlets.

Rule Four:

I. These rules shall not apply to a tributary aisle if:
 (a) Six or less people are employed therein; or if
 (b) Ten lineal feet or more of aisle length is allowed for each person employed therein.

II. Rules One and Two shall not apply if the tributary aisle is ten feet or less in length.

It has been found advantageous to paint broad white lines on the floor, marking the boundaries of aisles and insisting on the space between being kept clear and unobstructed. Projecting the handles of belt shifters, clutches, wrenches, valve stems, etc., into aisles should be avoided. When such, of necessity must be, railings or conspicuously painted fender boards should safeguard these obtacles.

Aisles should be well lighted. Dirt, rubbish and discarded materials have a faculty of accumulating in dark places only to trip, burn, explode or do damage according to the perversity of inanimate things.

Machinery should not be laid out so as to obstruct the light from windows, but placed so as to avoid the glare from direct day or sunlight shining in the operators' eyes. As few shadows as possible should be cast on the neighbors' machines or work. The best method is to place machinery and benches at right angles to the walls and windows, so that the light will come over the left shoulder or directly from overhead. Since we read from left to right, most of the work the eye has to do is on the left side. Excessive brilliancy or glare from a large quantity or high brightness of light in the field of view, specular reflection from shiny surfaces, high color contrast with surroundings, either from natural or artificial light, is detrimental to the sight and should be avoided. One story buildings, or the top floor of other buildings, have this advantage — that they allow of superior overhead lighting from skylights where the light can be effectively diffused by thick ribbed glass. Prismatic glazing in windows diffuses and throws the light rays in a horizontal direction. Shades, reflectors and diffusing glassware should be used to eliminate glare coming from artificial lights.

Since boilers and fly-wheels have the unhappy faculty, at times, of exploding and wrecking nearly everything in their path, when they rampage, it is well to locate them in one story buildings, with nothing above and nothing in line with their fury when they " start something." The bursting of a fly-wheel may be caused by overspeed, stoppage or obstruction of the engine parts, or by a sudden and extreme variation in the loads. An analysis and prevention of boiler explosions is a special study too long for this discussion.

Piping, valves, steam traps, diagonal braces, guys, etc., should not be allowed to project through the floor and form tripping hazards in aisles or passages. Such obstructions, when unavoidable, should be protected by standard railings or fender boards conspicuously painted. Piping should not be installed across passageways, aisles or exits to trip employees. It is sometimes advisable to install piping containing acid or caustic above the floor in order to readily detect leaks and for accessibility in making repairs. Where such arrangement is necessary, steps or inclines should be constructed over it. Where five or more risers are required, standard railings should be erected on the open sides. Gangways over tanks and vats should be protected in a similar manner.

Steam pipes should be properly supported and anchored and installed, so they can expand and contract without being subjected to severe stresses. Steam from a blow-off pipe should not discharge directly into a passageway or into any place where persons may have occasion to go. Boilers should be so arranged as to allow the two remote exits, which every boiler room should have, to be accessible in case of emergency, for quick get-aways. Pipes and conduits, when located in a pipe gallery or tunnel, allow more space for machinery and permit great accessibility in making repairs. When installed overhead, access to valves can be arranged by means of runways, guarded with standard railings having toeboards. The character of main valves should be indicated by signs to facilitate shutoffs in case of emergency, and if possible, they should be arranged so as to be operated from the floor. Valve wheels are to be preferred to the use of inverted angle or tee extension handles. It is considered good practice, when installing gas, steam, compressed air, fire lines, water pipes and electrical conduits, to paint each line a separate and distinctive color as an aid to locate trouble and as a safeguard so as not to open or close wrong valves in an emergency. Steam pipes, when exposed to contact, should be protected by a non-heat conducting covering.

Valves, belt shifters, clutch levers and other controlling devices should be located at least three feet away from the edges of vats or tanks containing hot, corrosive or otherwise dangerous liquids, unless provided with safety controls located elsewhere, or protected from splash or overflow. It is poor practice to carry high pressure steam pipes through offices or buildings where steam is not required. Radiators or heat coils should not be tapped to high pressure steam lines without also installing balance valves having a gage on the low pressure side.

It is of vital importance in an emergency to be able to shut off the power immediately and to do so without the loss of time consequent upon communicating with the engineer. Very often the seriousness of the accident is in direct proportion to the time that elapses before the shafting can be stopped. Means should, therefore, be provided in each room, or readily accessible to each group of machines, when not direct driven, for shutting off the power and stopping all shafting and counter shafting. This may be done with an automatic engine stop which consists of a valve in the main steam line, usually closed by an electro-mechanical tripping device and operated by a series of electric push buttons distributed throughout the plant. When the plant is electrically driven, the problem of emergency stopping is a more simple one. If all belt shifters were so arranged as to move in one direction to stop machines, any workman could do the act, if necessary. This he might not accomplish readily if one shifter operated from the right and another from the left. Belt shifter handles should not project below six and one-half feet and be in a position to injure workmen running up against them. They should never be located over passageways or be in any position where they are likely to be struck and unintentionally moved from the stop to the running position.

Machinery injures by its crushing, shearing or rotating actions. Directly, the cause may come from driving belts, chains or ropes, gearing, shafting, couplings, rolls, knives or cutters, reciprocating parts, traversing carriages, engine piston extension rods, revolving parts such as cranks, governors, rotating heads and counterweights. The aim and intent of the rules for the guarding of dangerous machinery, vats, pans and elevated runways, published in Industrial Code Bulletin No. 19 of the State Industrial Commission, is to protect workmen from such hazards.

When there is too little space between the pulley and the hanger, or the pulley and some other obstruction, there is always the danger of the belt wedging when it does slip off. This might result in pulling down the countershafting and part of the main line. By allowing more room, or making a rule to keep the pulley one and a half times the width of the belt away from the hanger, this danger could be averted. When a belt breaks, it clings to the driving pulley from heat adhesion, or perhaps static electricity rolls up and " whips " with the force and speed of a cannon ball. Unless belt guards are put up in a strong and substantial manner, able to withstand this great shock, they become a menace and flying pieces of guard only add to the calamity of the occasion. Metal fasteners in belts distort and leave sharp projecting points which injure and mutilate the hands manipulating them.

Taylor made a study and collected some extensive data on running belting, and he recommends that the ends of belts should be fastened together by splicing and cementing, instead of lacing, wiring or using hooks or clamps of any kind. Of course, it is much easier to take up the extra slack or stretch in a belt joined with rawhide lacing than to alter the endless belt.

Chains, slings and ropes in a well regulated shop should be tagged with their safe carrying capacity to insure against overloading, consequent breakage and injury. Standard safety railings should be substantially braced and capable of safely resisting the weight of a man's body lurching against them.

Metal railings are to be preferred, except in buildings containing explosives, or where the stock is readily ignited by a spark, or where from the nature of the process used, iron or steel is readily corroded. Wooden railings as safeguards should be avoided where they materially increase the general fire risk or form a connection by means of which fire could travel through the plant. When soaked with oil, grease, or decorated with oily waste, discarded overalls, soiled cloths, not only is the esthetic appearance jarred, if factories can ever be said to have such features, but what is of more importance, the fire hazard is unduly increased. In one plant, they changed the top member of the safety railing, placing it on edge so as to afford less comfort for employees who were prone to sit and rest thereon at odd moments.

Where cutting oils, grease, caustic, graphite, saw-dust on wood floors, paraffin, etc., produce a slippery floor condition around hand fed machinery such as calenders, saws, planers, engine and boiler rooms, etc., rubber or fibre mats, expanded metal, lead or other non-slip materials should be used. Wearing surfaces of drainage gratings, pit covers, manhole covers, etc., should be of never-slip material and set flush with the floor. All floor openings, where the safety of persons below is involved, should be guarded with standard railings having toeboards.

Safeguards should be constructed of metal. Steel mesh or punched material permits ready inspection without detaching and allows the percolation of light. Where heavy machinery is used, such as in foundries and steel mills, steel plate or cast iron will be required for safeguarding; all rotating parts of motors should be covered with closed sheet metal guards.

Wire mesh or punched metal, if used on motors driving metal cutting machines, would allow chips from tools to fly through the mesh or openings and perhaps short circuit the motor.

By painting the guards a conspicuous color, such as red, yellow, green, blue, etc., a cursory inspection of the shop would enable a superintendent to detect a misplaced or defective guard very quickly. This would be found helpful, even when the guards are of small size and when located in out of the way places. Guards should be readily removable for maintenance and repairs. For the manufacturer this is a fundamental requirement.

A guard should be substantial, and, once installed, remain in position without requiring periodic adjusting. A flimsy guard only adds to the hazard.

It should positively protect the operator, lead him not into danger but deliver him from injury. Some punch-press guards afford a false sense of security and the operator, when changing his dies, is hurt with a repeat stroke. This may be caused by stock or work falling on the treadle, or a defective brake, allowing the plunger to come down. For this reason, I am inclined to prefer a guard secured to the plunger which will do its work before every stroke of the ram. Further, a guard should not be designed so as to encourage trouble with the stock and be a "frame-up" where the cure is worse than the disease.

It should not obscure the working field of view. It should be adaptable for all classes of work that can be done at that type of machine and not be useful only for special or standardized operations.

Should a guard hamper a workman, reduce his speed and earnings and be unsuitable for working conditions, it does not function as an ideal safeguard.

It is then only a question of time when it will be discarded by the workman and something happen to it, unintentionally, of course, rendering it unfit for future service.

Metal finger guards, pliers, tweezers and tongs have been successfully used with increasing skill and safety with punch-presses and other machines. Compressed air, the vacuum cup, force from a stream of water or soda, ejector springs and inclined dies have been used with good service in removing light work. With the sliding die, the operator feeds and removes without ever placing his hands in the danger zone. With dial feeds and chutes, all the worker has to do is to replenish the stock.

Limiting the ram travel to three-eighths of an inch certainly minimizes the danger. The arm sweep, fence guards, wooden treadle backs and the two handed operation, all have their preventive usefulness, but the perfect universal punch-press guard still remains to be designed and the solution of this problem is a fertile field for the genius of an American workman.

GENERAL DISCUSSION

COMMISSIONER LYON: Now, let's have a discussion of Mr. Spence's paper.

MR. THOMAS J. CAHILL, President, Bricklayers Union No. 34, Brooklyn: Mr. Chairman, I would like to ask Mr. Spence in what locality those buildings collapsed. Were they under construction or were they old types of buildings, and in that locality did they have a building code to regulate construction of buildings in that section.

MR. SPENCE: I believe the answer to that is that buildings have collapsed in localities where they have building codes and also in places where they haven't any. Two years ago there was, I remember distinctly the newspaper account, a collapse up the river when the soil gave way, caused by excavating an adjoining creek.

Even down in New York, where they are supposed to have an up-to-date inspection system and examination of the plans, buildings have collapsed occasionally.

MR. CAHILL: Then we see the building code will not protect flimsy construction. I am in New York. We have just as many buildings collapse, I imagine, in New York City as we have throughout the state where we haven't up-to-date building codes. The Industrial Commission is formulating a code for the protection of employees on buildings, and I think it is a good idea to formulate a state construction code for the protection of every one. This is very important. We are all living in houses; we are all attending public meetings and we all frequent public buildings. It wouldn't be very nice for us to think that probably one of the foundations in this church wasn't safe. That is possible. There is no excuse for a collapse of a new building — none whatever. That is avoidable. It is either due to improper business handling or construction, or the materials going into that building do not comply or conform to the specifications as laid down by the architect. They either try to save on the material or the labor, but there is no excuse for any building, during construction, to collapse. I would like to hear from some other gentlemen and try to push along this good work of formulating building codes to apply in the state where we haven't any building code.

MR. MEACHAM: The gentleman who has just spoken has touched upon a phase of this building matter which I think is given too little consideration. It also touches upon a phase of the work of the safety engineer in the plant. Workmen in a plant are liable to the opinion that because a beam or a roof truss is constructed of steel that it will hold almost anything. I have seen repeatedly workmen take a machine and hang it to the lower cord of the roof truss; perhaps that would entirely overload the truss or the beam, as the case might be. It seems to me that that is something which needs attention on the part of the safety engineer. The matter of the overloading of floors is also important. It seems to me the gentleman has said something that is worth while when he has spoken of the state-wide building code.

MISS HARRIET M. MILLER: I'd like to ask just a few questions. Does the rapid vibration of machinery help to cause these collapses? Also, where these collapses have happened, has it usually been in manufacturing buildings or in other buildings?

MR. SPENCE: Vibration has very often been the cause of collapse. There was a large lithographing plant in New York City, I believe, that collapsed and there were quite a few lives lost. They piled these lithographic stones up along the walls and the vibration of the floors caused the stones to push out the walls and the employees in the plant were injured and killed. Of course, that building happened to be too weak for such a load.

MISS MILLER: Then the rapid vibration had much to do with it?

MR. SPENCE: It was quite an important factor.

MISS MILLER: In instances where these collapses have occurred, haven't they been mostly in manufacturing plants rather than other buildings?

MR. SPENCE: Usually it is in the manufacturing plants where there is the most vibration.

MR. S. S. LANDON, Todd Protectograph Company, Rochester: It seems to me they need an armor-plate code down in New York City to get anything done and get it done right. You will find that in most cases when these buildings collapsed, it was due to the fact that they were not made right in the first place.

I have been on building construction work in New York City, and it would certainly frighten you to see the brickwork done down there as compared to what we have in the up-state work. Vibration, of course, has a great deal to do with the building collapses. We have those factors that we must look out for. We must not overload the building. It should be designed expressly for the purpose for which it is to be used. We should have suitable supervision for building construction. Apartment houses go to pieces in New York City, and I think that perhaps a great deal of that is due to poor brickwork. Some of the brickwork I have seen in New York City is scandalous, so much so that when I took my family to New York I took them to East Orange to live instead of New York City.

MR. CAHILL: I agree with the gentleman that it is due to poor brickwork and also poor materials. I have in mind an apartment house which had reached the fifth story. It would probably house sixty families, and on an average of four to a family, that would be approximately 240 people. The most fortunate phase of that affair was that the building collapsed before any of the families or tenants had moved into that house and at a time when there were very few employees working on the building. Unfortunately, there were two or three killed and they got the rest away without taking any records of the injured. Those are the types of buildings I had reference to when I made the remark that there is no excuse for a new building to collapse. I still say the same thing here. There is absolutely no excuse for the collapse of any new building in the course of construction if the brickwork is done in accordance and conformity with the building code as provided in New York City.

MR. R. S. DOULL, Consolidated Gas Company, New York City: May I ask the gentleman as to the location of that particular building?

MR. CAHILL: It was on Marion Avenue at 188th Street.

MR. DOULL: Mr. Chairman, I have had considerable to do in New York with building companies. I must confess that I am very much surprised to hear criticism of the New York building code.

The famous Parker Building was mentioned. The owners of that building couldn't make it pay and they turned it into a printing plant. A fire came, the columns gave way and the building fell. Since that date a section has been adopted that every building shall be built for specific occupancy and will be built under certain conditions and certain security. The result is that since that time we have had no collapse of buildings in New York. Of course, we have had some explosions that blew up the buildings, but no collapses at all from improper construction or improper supervision on the part of the building department.

We do not claim our building code is ideal. It is not. I don't think it is possible for the architects or builders, the Fire Prevention Bureau, or all the Engineering Clubs of New York City to agree on one particular code. The code that has been developed is the product of the best engineering minds you can get. New York City is developing under that code in the most rapid manner. We have had colossal structures erected and we are not afraid of their falling, and we know they will outlive the present generation.

A state code in some locations would probably be advisable, but to make one general code throughout the entire state of New York, without consideration as to locality or the peculiarity of factories or the difference in ideas that come into the minds of the people throughout the different parts of the state, would be unwise. A code for Buffalo might not be well for New York. There are different conditions in the different sections of the state. I doubt very much if you could make one general code for the state of New York. The National Board has tried to make a national building code governing all the United States. They will be glad to tell you of the difficulties they have had. When you enforce it from a state standpoint and put the same penalty, or attempt to put the same penalty, on all sections of the state, it will be great injustice to the people of the state.

In certain counties of New York, they haven't today a building code except the state provisions for one. The larger cities have worked out their own destinies and the history of the state shows they have done it pretty thoroughly.

MR. LANDON: I want to thank this gentleman for his talk on this code of New York City, but I think a standard can be worked out for every building in the world. We have got to the point where we have fixed things to do. That is brought about by the standard buildings that we are able to have today. You will find they fall into about six classes. They take in almost every kind of manufacturing concern there is. When it comes to an apartment house, it ought to be absolutely safe beyond question, and it is up to the building inspectors in New York City to see that they are safe.

MR. W. J. PICARD, New York Industrial Commission: It might be of interest to those here to know that outside of Greater New York there are 300 municipalities in which factory buildings are located, and in these there are twenty-eight building codes. That means that the balance of the municipalities are so independent and so ignorant of what the structural provisions of the law embody as to the making of a universal building code, that they have none. Provided the classification of occupancy depends upon the type of construction and height of the building and the contents of the building, I believe it is more or less possible to make such a code and make it applicable to all communities.

MR. SYDNEY J. SMITH, Factory Inspector, State Industrial Commission: I'd like to ask Mr. Doull to explain the collapse of the building at 54th Street and Third Avenue.

MR. DOULL: To confess, I haven't heard of it, sir. That is a particular location of New York that I don't frequent as a rule.

MR. MEACHAM: Mr. Chairman, the object of a code is protection to the community in which the building happens to be placed and also protection to the inhabitants of the building, regardless of its occupancy. Of the 300 communities in the state mentioned by one of the speakers, I dare say that a great many of them have no building codes at all except what is provided by the state law.

Take the ordinary community about New York. A manufacturer wants to put up a building, and the occupants of that building are dependent upon the engineering skill of the designer for safety. When I speak of a universal building code, I have reference to a code which shall have some accepted standards for strength of materials, etc., as usually are embodied in that code.

MR. M. I. SIEGEL, Factory Inspector, New York Industrial Commission: I believe that those gentlemen who took issue on the construction of buildings in New York City were somewhat right, but I think they did not quite understand each other. I believe the codes in New York City are all right. I believe that the inspectors in the Building Department of the City of New

York are all right so far as they can go. Everybody knows that the City of New York never had enough building inspectors to properly cover the buildings during their construction. When you look back to the period of the building boom in New York City and remember that every cloak manufacturer and every sort of a carpenter became a builder, you will realize that a lot of buildings that went up in that boom were built for the least amount of money possible, and to supervise the construction of those buildings would have necessitated a building inspector being stationed continuously at each building to watch every grain of sand that went in the building. In Brooklyn they built rows and blocks of buildings of the poorest type. You could go in one of them and stick your hand through the plaster. It was no more plaster than I am a saint. It was simply the fault of a lack of supervisors in the city of New York to inspect those buildings put up by men who called themselves builders, who constructed buildings in which human beings wanted to reside, and they didn't know a single thing about buildings. But so long as they put up these frail structures and got the money it was all right with them.

Mr. James L. Gernon, First Deputy, State Industrial Commission: I believe that there is only one solution for the safety of the people who are housed in buildings of any description in the State of New York, and that is by a state code. No code is any good unless it is broad enough to take in all types of buildings. There is no need of constructing a building in the State of New York, in some secluded portion of the state, that is one story high in the same way you would build a New York skyscraper, but they should be built substantially. I can agree with the gentleman who said there was absolutely no need for a building to collapse if it is properly built and if it is maintained and used for the purpose for which it is built. If it is constructed properly, it will be almost impossible to overload it.

I can run my memory back twenty-five or thirty years and see that the buildings that have collapsed are those where speculative builders were trying to make money, and there have been very few factory buildings that have collapsed.

In Brooklyn, a few years ago, one did collapse, because somebody tried to overload an old building, that was something like thirty-five years old at that time, with beans. They loaded beans into that building until it collapsed. There was also a building in Poughkeepsie that was loaded with wheat to its capacity. It took fire, and when they put water on it, of course, it did what every building, made as that one was, would do, and when they put water on the wheat, it did like every substance of that kind would do, also. The wheat expanded and pushed the building apart.

The reason for a universal code can be demonstrated in the application of the factory laws to certain communities in New York State. About eight or ten years ago — to be exact in 1908 — we established the Mercantile Bureau in this state, and when I went into one of the second class cities of this state and asked them whether they wouldn't give me a copy of the sanitary code, the fellow who had been there some thirty years scratched his head and said, " I don't know whether we have one. I'll look for one." He brought out one, after some search, that was printed in 1862. When I asked him, " Is it possible that this is the only code you have? " he said, " That is the last one we have that was printed. I don't remember when the code was adopted."

What happened was that when we attempted to apply decent conditions of sanitation in that city, we were met with the argument by the people who owned the buildings, " Why, this closet has been here forty years." Of course, we could testify to that ourselves. As soon as you looked at it you knew it. So that community hadn't advanced with some others.

We have as good buildings in almost every portion of this state as there are in New York City. We have as good buildings in New York City as there are anywhere in this state. It is a question of safety. There is really need for uniformity. If a man is putting up a building and knows his business, he is going to build it properly. Our experience in handling the plans of factory buildings in this state demonstrates that the architects who are paid to design and construct buildings or supervise the construction of them know very little about this problem. That is rather a harsh statement to make about architects, but some of the people here know that what I say is so. We have given every architect in this state a copy of the law and called his attention to the provisions, and still they execute those provisions in all kinds and manner of shapes.

The difficulty in this state is that architects don't design all factory buildings; architects don't design all kinds of buildings and construct them. That is the unfortunate proposition. There are localities in this state in which you can see from the construction of the factory buildings that some fellow who knew how to build a barn in 1702, tried to design the manufacturing plants. It is not modern, not up-to-date, not efficient and there is no strength to it. It may be considered a good building, but it isn't, so that what we need is a standard building code worked out with reason. We know that you have to take into consideration where you are going to put the building, what kind of ground it is going to be located on; there are many things to be considered; there is the question of sanitation; there is difficulty in locality, in the type of sanitation, and these things must be overcome.

MR. A. E. DAVIDSON, President, Chesebro-Whitman Co., New York City: I agree thoroughly with the last speaker, particularly as to the fact that all kinds of people design buildings and all kinds of people are allowed to build them. Buildings are almost the most important things in our lives. Two years ago I came here with my friend, Mr. Cahill. We broke in on a meeting and asked a few questions, and from that came a discussion of making a code on safety lines and building.

I want to say to Mr. Doull that if I were as good a speaker as he is, I would take issue with him. I have brought up privately the collapse of the building at Third Avenue and 54th Street, of which the gentleman in the other part of the room spoke. I am particularly interested in that building for I pass there every day, and it is a pretty fair neighborhood down there. I do my business on that street. One of the finest hospitals in the world is on that street. The Rockefeller Institute is at the foot of the street, where they learn more about medicine than in any other hospital in the world, so it is not a bad neighborhood after all.

I watched that building every day. After it got up to the second story, I went on the other side of the street and all of my men did, but many, many people, hundreds of people, knew nothing of the danger and passed by that building while it was under construction. The man who built it must have been smarter than the inspector, for he was the type to get away with things.

On the morning of the collapse I was in a hurry and I passed down on that side of the street. When I got down in my office I was cursing that sort of of work. That afternoon I intended to come up to this convention. That was two years ago. I ordered a picture taken of the building to show the construction at that time. I happened to be in a building down town, and I called up my office in order to get the picture taken that afternoon. When I came out of the building, I got an evening paper and I found that the structure had collapsed. A man was killed, and if it hadn't been for a storm, many people would have been killed because many people pass that corner of the street, blind people going to that hospital, too. The contractor on that building was not the right sort. He couldn't have put the right material into the building, so the building collapsed. That is the history of that particular building. I have been interested in buildings from the cellar to the roof in New York City for thirty-eight years. I agree with Mr. Cahill. There is no necessity for a collapse, and there never is a collapse where there is a first class contractor on the job.

MR. DOULL: Mr. Chairman, I don't want to intrude too much on the convention, but I find I have to defend myself. Of course, I have never been in the neighborhood the gentleman speaks of because I have always enjoyed the most extreme good health. I don't want it understood that I absolutely oppose a state code, but I take the ground seriously that because a law exists the situation isn't necessarily straightened out. Because one building in New York has fallen within the last few years, there is no reason we should call in the whole state power to regulate conditions in New York City. We have laws on the penal code that have been violated time and time again in New York City. I do not oppose a state code. My attitude is somewhat like that of old Bill Tweed when he was foreman of the old Big Six Engine House. A very important question came up upon which all the men differed. It was as to the color of paint to be applied to some object there. Some wanted red, some white, some blue, and so on, and some wanted black with a gold stripe. Finally one man said, "Here, Chief, you are quiet on this; I'd like to ask you your opinion." The Chief said, "I want to keep out of this; I want you to decide it among yourselves. As long as the apparatus is painted green I don't care what color you paint it."

Of course, I don't care what code is adopted in New York City, provided it is a New York City code.

COMMISSIONER LYON: If there is no further discussion, the meeting will stand adjourned.

TUESDAY EVENING, DECEMBER 3

PRESIDING OFFICER: MISS NELLE SWARTZ, CHIEF, BUREAU OF WOMEN IN INDUSTRY

MISS SWARTZ: If the war has made one thing plainer than anything else, it has been the direct interest of the Government, both state and national, in women's work. The establishment of a Bureau of Woman in Industry under the Department of Labor and the creation of a Bureau of Women in Industry, under our own State Industrial Commission, is a direct expression of our nation's and state's vital interest in women's work.

To-night we have with us, as our first speaker, the woman who was called to be Chief of the Bureau of Woman in Industry of the Federal Department of Labor, who has been our counsel and help in our war program, and the one to whom we are looking for leadership in this period of readjustment and reconstruction. I have a great privilege in introducing Miss Mary Van Kleeck.

WOMEN IN INDUSTRY—A NEW SAFETY PROBLEM

BY MISS MARY VAN KLEECK, DIRECTOR, WOMAN IN INDUSTRY SERVICE, U. S. DEPARTMENT OF LABOR

Since the last meeting of the Safety Congress, there have developed new problems affecting women in industry, which, it seems to me, are certainly the concern of this Congress, that is, the introduction of women into occupations likely to cause industrial diseases. I take it that this Congress is not interested only in protecting workers against accidents due to machinery but that they are also interested, and will be increasingly interested, in the safeguarding of workers against diseases which are just as much due to their occupation as any industrial accident.

During the period of the war women began to take the places of men in such industries as the chemical industries, the explosives industries and in such industries as the manufacture of storage batteries in which I do not believe there were any women employed, or certainly only in isolated instances, before we entered the war. Their employment in those occupations makes clear the problems of protecting all the workers in such industries.

Two or three weeks ago I saw a letter sent from the physician in a large plant manufacturing war munitions in another state, addressed to the Industrial Board of that state in response to an inquiry from the Industrial Board. The Industrial Board was considering relaxation of its regulations regarding the employment of women in occupations involving the handling of any nitro and amido-compounds; inasmuch as these compounds were important in the explosives industries and in the manufacture of munitions of war, and inasmuch as it was clear that more women were going into that work, the Industrial Board wrote to the manufacturers to get their opinion. One letter said in reply that the employment of women in the chemical and explosives industries is a new game expanding rapidly. They said, "When it was first suggested, we held up our hands, but pretty soon we got used to seeing women employed about certain of our buildings and that encouraged us and now I am free to say that I do not think there are any occupations in the chemical industries or the explosives industries in which women cannot be employed, excepting those requiring the lifting of heavy weights."

Now, that represents, if it represents any large number of manufacturers, a reversal of our attitude on that subject which has hitherto wished to protect women against employment in occupations exposing them to industrial diseases.

An expert in industrial diseases, who is interested in it from the point of view of protection of the workers and not as a manufacturer, said, when this subject was first discussed, "It doesn't seem to me that it is any worse to poison a woman than a man, and I am hoping that if women are introduced into these trades, we may at last begin to take some measures of protection, whereas, if only men are continued to be employed, we won't pay any attention to it."

If that is the result of the continuation of women in those industries involving industrial diseases, we shall have gained something. So, perhaps, by considering the introduction of women into these industries we may point the way toward a program which will mean much more adequate protection for men workers.

I may take, as an illustration, a place very near home, since that happened to be a place presenting a problem to the Federal Government, namely, Niagara Falls. The Employers' Association of Niagara Falls, early in the summer, wrote to the Federal Government, asking the Federal Government to use its powers to make possible the employment of women in the chemical industries there, especially on night shifts, pointing out that if women were employed at all, they must take their place on night shifts, which, of course, was contrary to the laws of New York State. As you all know, the industries of Niagara Falls are manufacturing very vital products,— very vital for the war — picric acid, chlorine gas, caustic bleach, carborundum products, wheels for tanks, and a great variety of products that were basic in the war industries as they are in the peace industries.

This letter, asking for cooperation from the Federal Government in the introduction of women into these industries, meant to the Federal Government something more than appeared on the surface. It indicated a lack of available labor supply in industries which were very essential in the war program, and, therefore, it could not be handled merely as a request, answering "Yes" or "No" or "You cannot violate the law of New York State and employ women at night." It demanded an analysis of the reason why there was not an adequate supply of labor in those essential industries, and so the Woman in Industry Service of the Department of Labor decided to associate with it in this work the War Department, the Navy and the Public Health Service, all departments interested both from the point of view of contracts for the Federal Government and from the point of view of the health of the working population. Those associated groups, together with the Industrial Commission of New York State, made a brief investigation at Niagara Falls during August and September. Niagara had been investigated before. You probably all recall the investigations of the New York State Factory Investigating Commission in 1912 and 1913, and the facts about hazards in those industries were well-known as a result of those investigations.

We know that in the chemical industries the hazards are due to dust and to the fumes and gases and to the contact of irritating substances on skin and mucous membrane which causes many very serious physical abnormalities and physical diseases. That report of 1912 and 1913 had traced through physical examinations the effect of some of those industries and some of these occupations on the workers and had recommended certain very definite protection. These remedies are well known.

There is first of all the engineering problem of removing fumes and gases and dusts at their source. Then there is the problem of maintaining absolute cleanliness in workrooms, the problem of providing washing facilities, hot and cold water, enabling the worker to be so cleanly as to avoid the most serious dangers of these industrial causes of diseases. There is also underlying all of these precautions the necessity for adequate medical supervision and physical examination. Those things were well-known; it was not necessary to prove them again, but the effort of the Federal Government was to study the possibility of the employment of women, and especially to point out again the necessity for these safeguards in order that the vital production program of the War Department and the Navy might not be interfered with.

We found in the chemical industries of Niagara, plus also certain miscellaneous industries, such as the manufacture of storage batteries, about six or seven hundred women employed out of a total working force in those particular plants of 9,000. Those women were employed in largest numbers in the abrasive industries in the manufacture of carborundum products. In next largest numbers they were employed in the plants making storage batteries, and then they were scattered through the various other plants doing outdoor jobs, loading and unloading freight cars, loading wheel-barrows, wheeling wheel-barrows and taking part in what we call common labor in those plants.

In the abrasives industry we found by actual dust count that in certain of the occupations, in the manufacture of emery wheels, there were actually more than 17,000,000 particles of dust per cubic foot of air in certain of those operations. That is inorganic dust, siliceous dust, and it would seem to be possible to account, at least in part, for some of the death rate for tuberculosis in Niagara Falls by the presence of an industry there in which there was no proper system of dust removal.

In the plant manufacturing storage batteries, the precautions necessary for handling lead oxides were not taken. There were wooden floors with the lead ground deep into them. There was not the possible provision, for handling the lead without touching it, for an automatic handling of the lead in certain of the processes. There was very little observance of the necessity for cleanliness. There was no adequate medical supervision.

Those were the two occupations in which women were employed in the largest numbers in Niagara Falls and so we concentrated attention upon them. Of all the possible industrial diseases in Niagara Falls, the lead industry is the one which presents peculiar hazards to women. Women, in the first place, have generally been shown to be more susceptible than men to lead poisoning, that is, of a given group a larger number would be more liable to lead poisoning, but more than that, lead poisoning is a race poison. There is no proof that lead poisoning in men affects the offspring, but in women the lead poisoning affects the children and results either in sterility or miscarriage or the death of the children under one year of age. So the employment of women in the lead industries, in Niagara Falls, in Indianapolis, in Cleveland, and in the manufacture of storage batteries which is, perhaps, the most dangerous of all forms of lead, presents a peculiar hazard for the race, and it would seem clear that we can at least formulate this rule: That women are not to be employed in any occupation in which the poison is more serious, has a different effect upon women from its effect upon men, and that, therefore, we ought to rule clearly that women should not be employed in any of those occupations in the lead industries involving such close contact with the lead as to mean the probability of lead poisoning.

The other poisons in Niagara Falls are poisons which do not have a different effect upon one sex from that upon the other. Perhaps it is true that it is not worse to poison a woman than to poison a man. Nevertheless, we felt we could take this position from the point of view of women in industry,— that if it was necessary to employ women, we must at least insist that every possible safeguard should be taken before women were introduced into the industry. In other words, the possible introduction of women into an industry offers an opportunity for house-cleaning, offers an opportunity, for instance, in the abrasives industry for safeguards where the effect of the occupational disease would be just as serious for men as women and for removing the danger. It is possible to have exhaust systems which remove dusts at their sources. We will say for the Niagara plants that already steps have been taken to make some changes.

The situation at Niagara, and we might as well discus it frankly, is this: The capital back of those plants for the most part does not live in Niagara; it lives in other states, and we found in one or two instances that the capital back of some of those Niagara plants is very keenly interested in preventing industrial diseases in other states, but it has not happened to have any direct contact with its own industry in the State of New York, and so we must face the fact that it is not public opinion in New York State or public opinion in Niagara Falls, or even the best of intentions on the part of management on the spot in those plants which is going to change those conditions. Somehow or other we must get a more effective hold in order to make it profitable to change those conditions, but before we speak of the way in which that might be brought about, there are two or three other aspects of the question affecting the employment of women in Niagara plants which ought to be considered.

In the first place, the fact that women are paid very much lower wages than men is a fact which deserves consideration here. Wages have a very direct relation to industrial diseases. In certain investigations made abroad of the employment of women in the lead industries, the fact that women were more susceptible to lead poisoning than men has been attributed by some very sober scientific investigators to the fact that women were paid less than men and consequently had lower vitality due to a lower standard of living. If there is one precaution necessary in relation to exposure to poisons, it is that the vitality should be kept up. The moment vitality is lowered it means greater susceptibility to poisons.

Not only have wages a very direct relation, but hours of work have a very direct relation to industrial diseases. In the Niagara plants there are men employed now in some instances twelve or thirteen hours a day. In some instances there is the three eight-hour shift system. In other occupations ten hours prevails for men. Long hours mean two things in the dangerous trades. They mean, in the first place, lowered vitality again and hence greater susceptibility to disease. In the second place, they mean just so much longer exposure to disease. If you employ a man ten hours a day and he is exposed to a particular kind of poison, that is two hours more exposure than eight hours. If you employ him seven days in the week, you not only do not give him time to recuperate and regain his vitality, but you expose him so much longer to the dangers of poison and disease.

All these apparently remote problems of wages and hours enter very clearly into the possibilities of safeguarding against industrial disease.

Add, then, to the lower wages of women also the fact that generally speaking the women who would be available for work in such a place as the chemical industry of Niagara Falls were married women with home duties. Therefore, their day's work was not ended with the ending of the factory day. There was, therefore, just so much more fatigue for women. I think we can prove, perhaps, that the employment of women in poisonous industries may be more serious than the employment of men, certainly under present conditions. There are certain other hazards in the industries of Niagara, not peculiar to them, but found in them. One is the lifting of heavy weights. Women are more seriously affected by the lifting of heavy weights than men. The muscles of their arms are not so strong, and the strain of a lift comes more upon vital organs, therefore, and the fatigue is greater. If women are employed in heavy lifting it will have more serious results for the race and themselves than if men are employed. It would seem a very economical thing to use as many heavy mechanical devices to take the load off as is possible. Perhaps if we had been longer at war and it had been more necessary to employ women, we should have had more mechanical devices. There are many, many devices which can be used which tend to relieve the shortage of common labor, and certainly that is one of the things to which we need to pay attention.

While this investigation was in progress, or shortly after it was completed, the armistice was signed, and with it came the removal of the pressure for the introduction of women. Had the war gone on, we would have been obliged to do what we originally planned to do in the Niagara industries — first of all point out the removable hazards which ought to be removed before women could be introduced; second, select in a kind of graded scale the occupations in which it was possible to employ women at once and those in which their employment ought to be postponed until the shortage of labor became more acute.

With the signing of the armistice it seemed clear that the employment of women in those industries ought to be discouraged. First of all, we recommended that no women be employed lifting weights of more than twenty-five pounds. There is no really scientific basis for determining how much weight women may lift. We all agree that it depends to a certain extent upon the woman and how the lifting is done. New York State already has in its statute, regarding foundries, the twenty-five pound limit.

We recommended that women be not employed in the yard work and wheelbarrow work because of the tendency to heavy lifting and because there was danger that, with the great shortage of common labor, women would be introduced too rapidly into occupations of that kind, and we needed a safeguard against it.

We also recommended that no women be employed in occupations in which the effect was clearly more serious for women than men, such as the lead industry, and that women be not employed in other industries in which there had not been taken the recognized safeguards against industrial diseases.

The labor problem at Niagara, in short, is really a health problem. It is a problem of health in the community and a problem of health in the plants. It is possible, of course, to accomplish something by the pressure of public opinion, but certainly we did not have any such safety movement until we had workmen's compensation laws, and I do not believe we shall have any adequate safeguards for men or for women in the occupations involving industrial poisons unless we have the workmen's compensation law extended to cover occupational diseases or unless we have health insurance which covers occupational diseases. Whichever step will get us there fastest is the one to take now.

We have the chemical industries which are enormously important in the commercial life of the country now just as they have been important during the war. We shall have problems of labor supply. Women are already in the chemical industries in various parts of the country. I hope that New York State may take the lead.

Since 1913 I do not believe that we in New York State (as I am a New Yorker I can say "we" and not speak from the point of view of the Federal Government) have done very much in changing the conditions at Niagara Falls, and I think the reason of it is that there is not at present, and has not been, any compulsion to get that change made. I know that the Industrial Commission is interested in accomplishing just that thing. I hope that we may take that step forward,— include occupational diseases under the workmen's compensation law and demonstrate that what the chemical industries have accomplished in this country from a scientific point of view can now be accomplished from the point of view of protection of the lives and health of the workers.

Miss Swartz: We are going to have discussion of the various papers delayed until the end of the program. If any of you have any questions to ask, bear them in mind.

Several weeks ago, a member of the staff of the Bureau of Women in Industry was talking with a colored woman, employed in one of our large factories, and asked her if she was a member of a Trade Union. She replied, "I don't know; I never saw one." Tonight we are going to see one of the prominent women in New York State who speaks for the International Brotherhood of Bookbinders. We feel this would not be complete without the point of view of a Trade Union woman.

I am going to introduce to you Mrs. Catherine Wolter, of Buffalo, New York.

SAFETY FROM A WORKING WOMAN'S POINT OF VIEW

By Mrs. Catherine Wolter, International Brotherhood of Bookbinders, Buffalo

Madam Chairman, Fellow-workers and Friends: I am sure that each and every one of us is proud of the privilege of being able to attend the sessions of this wonderful Congress. I know that you realize the vast problems there are before you and the vast problems there are to come. Personally, I appreciate this wonderful chance of coming before you to learn something about these problems and to help, if possible, in my small way to cement into unity the employers and employees of this State of New York toward a sound, economical and industrial situation in New York State.

I am sure that we all realize that because of the war and because of the chance that the war has given America to learn why conservation is so necessary, we should use advantageously those things we have learned. They told us to conserve the food and the fuel and all the other facilities that America had to offer. To my mind, the most important of all of these, while they were all so necessary, is the conservation of human life and energy.

We realize that, even though we had this wonderful mobilization of a huge army to go across, the mobilization of that army would have been of no avail if it had not been for that powerful army of robust soldiers of industry who were here behind the lines. So we go on with the hope that they may remain robust. We hope here to deliberate in a way that will help to sustain them as robust soldiers of industry.

Among that army of industry are the women and the children of industry of America. I can't help but say something about the children of industry because the girl children of industry are the future women of industry of the country, and I hope that you will be able to eradicate in this State some of the conditions that have controlled the children of industry. It is general throughout the country. We haven't always been able to find it out, but the war has taught us so, and I have in mind some of our real patriotic men in America who wondered, when the war began, how they could help America win the war and use the children of industry. The question hasn't all been solved, but we will go on and try to solve it. Some of the wonderful men of the South interested in the cotton industry — one in particular asked one day of a member of the British Labor Commission in Washington, "How can we arrange it so that the children of industry in the South might be used to help America win the war?" The answer of that wonderful labor man was this: "If America must win the war at the expense of the women or the children of America, better that the war had never begun." So let us preserve the lives of the children of the nation because they are the future women of industry — the girl children, and, of course, the boys, too. Why is it necessary to preserve the lives of the boys of industry? Didn't we get a wonderful example of it when the draft-boards gathered together and the exemption boards had their work to do? Many of them were exempt who wanted to go and fight. Why were they refused? Because many of them, while they were working, had no child labor law to protect them, and when the time came for them to defend their country, there was a physical deficiency.

Aren't the girls of industry the future mothers of the race, and what does America ask of her women? An asset of strong, healthy, robust children so that they may not, because of unfair conditions, be a liability on the nation.

I have in mind the little children in a certain town in the State of Iowa. They sewed buttons on cards that we buy in stores. They worked early in the morning and after school and late at night, and they sewed buttons for a cent and a half a gross. Some of our men say, "What has wages to do with a Safety Conference?" Why wages has everything to do with the safety of the workers!

What does it profit us to have sanitary, wonderful conditions in a factory where we work if we don't have wonderful, sanitary conditions where we live? The worker must have sunlight and pure air, not a third-story room in a tenement without elevator service, after standing perhaps for ten hours a day on a cement floor with no pad under the feet. I hope in our newly constructed manufacturing establishments of the country they will compel this thing to be done.

There were many defects in this factory, but these little girls went on and sewed buttons for a cent and a half a gross and they not only did that but for safety they carried these buttons from the factories to their homes, and sometimes they dragged them on the streets because they were unable to carry them. Sometimes a little fellow was fortunate enough to have a little express wagon or a discarded cart, and the little fellow pushing the cart with its load of buttons should have been the occupant. Children from 4 to 14 years of age sewed these buttons. They are doing it in New York State as well as in Iowa. Iowa needs an Industrial Safety Congress, but the New York State Industrial Safety Congress needs to be getting busy and seeing that the children are not exploited to this degree.

I mentioned a moment ago that wages had everything to do with safety. I have in mind a plant right in Buffalo. I visited there one day and found the office department of that plant ideal. It was like a conservatory, wonderfully fitted in every way. They even had sounding boards to contract the sound of the typewriters so that the workers wouldn't be disturbed. Flowers were brought every day from the conservatories of one of the proprietors. I was told by one of the workers there that the average wage before the war was $7.35 a week; $7.35 a week would not buy many cut flowers for the parlor and we ought to have some flowers in the parlor as well as where we work.

What about the little girl who has to figure up on pay-night so much for her room — so much for her room that is not fit to live in if she must go back to work in the proper condition the next day, if she must give the efficiency that she desires to give to her employer and which that employer desires of her; so much for the lunch which will not keep her alive so that she will come back fit to give that efficiency on the following day; so much for her carfare and all these other items. Sometimes she stays at home all day on Sunday to do her laundry because she hasn't the money to have it done during the week.

Wages has everything to do with the health of the workers — as much as the safety movement in the factories and the mills.

How about hours? Something else which has everything to do with safety. I have in mind the great canneries of this State which, in spite of the Ten-hour Law, worked overtime during the war, and they used the plea that it was because of the war, that they had to conserve the foods of the country. We conserve the foods every year in the canning industry, and women have to work every year in the canning industry the same as they did this year, but they worked until 3 o'clock in the morning during the war in those factories. It is true that women like to earn a lot of money, but they will work those hours at the expense of their future because they will not, perhaps, be alive next year to do the canning, so if the canning of America must go on, the women must live to do the canning and they cannot do it unless they are physically fit to do it.

Take the hours of the waitresses, for instance, in my own city of Buffalo. The law says that no women shall work after 10 o'clock at night, yet they work until 12 o'clock at night in two restaurants there. They went on a strike there in the summer for a living wage. They were earning five or six dollars a week. What was their work? Not alone must they serve the patrons, but they must wash the tables, clean the silverware and do all these things, and perhaps in the midst of scrubbing a table a patron would come in to be waited upon; then they would have to stop and wait on him. Then the patron thought he had paid them for that, by giving them a tip.

There was nothing done to relieve that situation. There was no special group, even of women, who came forward to interest themselves in those girls, yet their interest must be protected as well as that of any other group of women and they must have safety in the restaurant as well as at home.

Why haven't we something in this Congress to enforce these laws. Why shouldn't it be the duty of the employer as well as the employee to conserve the human energy and all these other things concerning every woman who works.

The railroads of the country, I am told, have worked their women during the war from seven o'clock in the morning, or rather from seven o'clock at night until seven o'clock in the morning, in spite of the fact that there shall be no night work.

Is there any work for this Congress? Of course there is! What good are all these laws if they are laid on the books of this great State and die there? The men are busy about it, I know. They have always been busy, some of them have been extremely busy but there has been a little difference in just the last year. The men always voted, but now we vote, too, thank you, and we want to help you see that these laws are enforced. We want to help you to see that the conditions of the women of industry may be as perfect as those of the men.

I am a bindery girl by trade. We often found that the binders, unless they were in a huge establishment where each department could have its own floor, were pushed over into the dark in the corner. The typesetters, the linotype machines, the printing presses and all the other machines were over in the daylight. They had to have light; the men's work was so important that they had to have light, but the girls could sit way back in the corner with artificial light, and they had to find a gage on their folding and they had to do all these things, but they could do it in the dark or try and get along with electric light. Women need protection in industry. Women need safety regarding all these things.

There is much bronzing done in the printing establishments. The girls have had to smut these bronze sheets with a little piece of cotton. They handle a great deal of that bronze dust. The windows couldn't be opened because if they were the sheets would be crooked on the press and the job would be spoiled, but the lungs inhaled all the bronze dust. There was no sunlight or daylight either. They have, as I said before, these cement floors. It is true that we have now, in the printing establishments, gathering machines to gather up certain kinds of work and put it together before it all goes to either the sewing machines or the wire stitchers. Sometimes there is work that cannot be done by these gathering machines and girls must walk continually all day and gather up these sheets and put them together. I wonder how many of you ever tried to walk ten hours straight around a large gathering table. I wish you would try it once and see if you wouldn't come to the Industrial Congress every year so these laws may be enacted and enforced to take care of these little things so trivial to many employers but so vital to the workers themselves.

All these things can be regulated by your Congress. I know that you will do your utmost to protect the children and the women of industry. I am sure that labor is to be congratulated on the part that it takes in this Congress, because labor's effort has always been toward the very things that you are striving for here.

To the manufacturers of the State I say this: That you also are to be congratulated because of your desire to get together with the workers of the State to perfect the conditions that will tend to a greater efficiency toward a greater America.

Miss Swartz: One of the most interesting developments of the war, it seems to me, has been the development of the training schools in the factories throughout the State. They are commonly known as vestibule schools. One of the best of these schools, it seems to me, has been established in the Wright-Martin plant in Long Island City, and we have with us to-night Miss Laura Sanford, of the Wright-Martin plant, who will tell us something of their training school for women in that plant, and its relation to safety.

VESTIBULE SCHOOLS IN INDUSTRY

By Miss Laura Sanford, Supervisor, Women in Industry, Wright-Martin Aircraft Corporation, Long Island City

Madam Chairman, Ladies and Gentlemen: I felt all along that some one owes you an apology for the presence of one so inexperienced and absolutely new to the industrial field as I. I am, however, going to leave that apology to Miss Swartz for having asked me to speak, and if that is not sufficient, I am going to suggest that you demand one from Miss Van Kleeck, because she really is responsible for my being in the field of industry at all. She found me last spring in a comfortable academic position, and after some wandering about and some indecision I landed in a big industrial job.

The Wright-Martin plant was under Government contract, at the time of the armistice, to produce for the Government 10,000 Hispano-Suiza motors by the first of next July. They have factories at Long Island City and New Brunswick, New Jersey, and a shop in Newark. They had come into your home city and had taken over the Franklin automobile plant and had planned to organize that to produce the same motor.

The head of the corporation, Mr. Houston, was very closely associated with labor on this program, and their intention and their effort was to carry out the fairest and the squarest agreement with labor that could possibly be carried out. The selection of a woman to have the women's interests in charge was part of that policy, and the fact that they followed such a policy shows that, comparatively, my position, my job, was an easy one, that is, so far as the intention of the organization was concerned.

A great many very interesting problems have come up, and I feel that I have gotten some education out of it, at least, whether I have done anything constructive or not.

I had rather planned, I think, to come here and to engage your sympathies as a beginner in the field and depend upon your kind indulgence, but I have prepared a paper, and with it I shall at least not be in the position of the minister who found himself in the pulpit just before time for his sermon, having left his manuscript at home. He explained to the congregation what had happened, saying, "With your kind permission we will not have that sermon until the following Sunday; for the present we will depend upon the inspiration of the Lord, but next Sunday I hope to do better."

Recognizing the need for intensive training of men and women for increasing the supply of machine operators for the production of war essentials, the Wright-Martin Corporation planned and developed two Vestibule Schools or Instruction Departments; one at the Long Island City plant and one at the plant at New Brunswick, New Jersey. When the armistice was signed the two schools were ready to turn out operatives at the minimum rate of 100 each per week. The Long Island City School had been in operation since June and had sent to the factory approximately 200 women. At no time had it been strictly on production. This was due to lack of proper machinery both in the school and factory. The New Brunswick School had been running on production for six weeks or two months but not at capacity, as the factory had not completed its arrangements for caring for women, such as toilets, rest and locker rooms.

Had the war continued, we undoubtedly would have been employing thousands of women early in 1919. As it is, I thankfully sum up my experience with something between four and five hundred factory workers, all of whom, except the core makers, went through the instruction school.

These women were selected by an intelligent woman in the employment department, and selected on personal interview and estimate only. I believe the types of women and variety of experience and previous occupations to be as inclusive as could be found in any industry anywhere, even in war time.

There was every motive — every known motive given — patriotism in general and in particular, as two women had men relatives in aviation, one a son and one a brother. The bigger pay attracted many; some to support dependents, to save to complete a college education, and as one woman expressed it — to make extra money while the making was good. A few came for the very novelty of the work, and at least one came to learn more of industrial life and conditions.

The instruction included operations on the different types of lathes, screw machines, milling machines, grinders, drills, also bench work, inspection and training of shop and tool crib clerks.

The schools were organized and supervised by the Chief Instructor. There was an instructor in charge of each school, a man of thorough shop and machine experience, and from six to ten other instructors, chiefly women trained in the school. With one exception these women instructors had had no previous machine experience. Two or three were made instructors after a week's training.

After being transferred to the factory, the production of each woman was never recorded in such a way that I could get satisfactory data, but every foreman and superintendent has expressed himself as more than satisfied with the substitution of these women for men. I have had trays of finished products shown me — one by a woman on nine-hour day shift and one by a man on eleven-hour night shift, and the statement made that the woman's work was 50 per cent better and more of it. All our experience goes to show what the British Ministry, the U. S. Ordnance Department and the National Industrial Conference Board have discovered and declared to be true, namely, that in metal industries there are certain operations better performed by women than by men.

The National Industrial Conference Board made an investigation of 127 metal industry establishments and concluded as follows:

> The experience of employers in the metal trades in the United States has clearly demonstrated the practicability of employing women in a large variety of manufacturing operations.
>
> In reviewing the record of efficient performance by women, it must be emphasized that most of the tasks in which they are engaged are semi-skilled work of a repetitive character in which rapidity, lightness of touch and natural dexterity are more important than skill required through long training and experience. It is too early to form conclusions as to the ability of women to perform work of higher skill.

Just here let me quote both the Head Instructor of our schools and the Instructor in charge of one of them, who say that out of 200 women trained in that particular school they could select twelve women who, after two and a half years of machine shop experience and four to six hours each week spent in study of blue prints, drawings and decimal equivalents, would develop into first-class tool makers.

In the Long Island School women without previous machine experience have been taught in two weeks to cut threads in engine lathes, and several women instructors with but three months' experience are grinding all their own lathe tools. This involves knowledge of changing gears and outside turning and pitch diameters.

As to production in the School itself, I have these figures: In New Brunswick School, which has been strictly in production since it started, the record for one month (October 1st, I believe), was 21,647 parts passed inspection and only 2.11 per cent rejected. The record for one day of that month was 3,610 pieces passed inspection and only three-tenths of one per cent rejected. This school, I am told, has been entirely self-supporting.

The result in accidents has been most satisfactory. There have been no serious accidents to women in either plant, and only three of semi-serious nature. Of these, two were due to failure to instruct properly and occurred in the instruction school. All the other accidents reported were of extremely minor nature, mainly small splinters in the hand. Dr. Stellner, in charge of the First Aid Room in Long Island City plant, states that his records prove a much higher percentage of accidents among men, and his observation convinces him that this is due either to ignorance or lack of interest.

Compare the easy transition of these workers from school to factory with the experience of a young woman last summer in a metal industry factory in Cleveland. She was a member of the Government class in Employment Management, but this fact was known only to the employment department, not to the foreman or superintendent. She went in absolutely new to the work and conditions and after one day's experience declared if there was anything worse than an I. W. W., she was "it." She is a very intelligent woman, a college graduate, and practical and efficient in everything she does. She tried her best to understand the foreman's directions, but was so confused and so carelessly directed that she felt the sooner she smashed something the better she would like it, as the nervous tension was terrific.

I believe immunity from industrial accidents may be largely secured in the training school through instruction in safety rules, familiarity with the noise of machinery acquired under careful and kindly supervision, and the confidence gained from knowledge of tools and operations. But in larger measure, I believe even such safety may best and continuously be maintained by constantly developing intelligence and interest in the work one is doing.

Last night Miss Dreier bade us look at safety in its broadest significance. While we are thinking of safety in terms of rules, mechanical devices and scientific discoveries to improve human efficiency and safeguard human life, let us not fail to consider the forces that threaten the destruction of all that humanity has so far attained.

We are, of course, greatly interested in the peace settlement and hoped for League of Nations, and I believe we also have faith that men of high vision and broad knowledge are engaged in bringing that task to a noble conclusion. Looking to the future, there are three subjects now uppermost in the public press, and, I belive, in the thought of all socially minded people — Bolshevism, Industry, Education.

A recent article in the New York Times entitled "Americanization as a Cure for Bolshevism" optimistically and, I believe, truthfully states that the war has done more to Americanize the people of this country than any number of years of residence could do; also that the millions of soldiers, who will bring home a keener appreciation of what liberty and democracy really mean, will do much to defeat Bolshevism. This is followed by a plea to the American workman to guard against the menace of Bolshevism and to join hands with this neighbors to fight such destructive movements. It adds that if he becomes educated and informed, his mind will not receive anarchistic propaganda.

There is, however, no constructive plan offered to employer or workmen for the Americanization which is to put Bolshevism to rout. We must not forget that while this war has demonstrated the greatness of democracy, it has also demonstrated the vileness of autocracy, and the average man in industrial life is keener to detect, and quicker to resent, destructive encroachments on his liberty and happiness than he is intelligent to constructively correct them.

One writer on "Live Subjects for High School Study" calls upon the High School to furnish leaders for constructive thinking on all social and civic questions. For this, he claims, it is necessary to correct our Elementary and High School curriculum and educate our boys and girls in all subjects relating to their duties as citizens. There are in the United States six times as many High School pupils as College or University students, and he insists that greater attention should be given to making them fit to bear the torch of democracy. He argues that the failure of Elementary and High School education has resulted in the average educated citizen having but the vaguest knowledge of municipal problems, and that many business and professional men are incompetent to form independent judgments on the great political questions of the day, but are at the mercy of their favorite newspaper.

The vision I have of permanent safety is this: A union of Education and Industry, and that this is the great opportunity offered to you manufactures and merchants to carry on the training for pure democracy begun by the elementary schools. Let your schools be Vestibule Schools for your particular kind of industry, but also let them be the source of knowledge and activity along all lines of human needs and interests.

It is not your duty to add culture courses and frills to industrial life, but it is your duty and your high privilege to help men and women to escape the danger of dulled intellects, loss of interest and efficiency, and ignorance, which is the road to Bolshevism.

One writer states that the revival of individualistic interests is the uppermost sign of the times since the armistice. Let us not lose the splendor of the sacrifices that have been made or that quickening of our minds and hearts to feel the needs of others. In this great reconstruction ahead, let us grasp every opportunity for service to the man and woman in industry.

One of the speakers last evening said that he believed cooperation of employer, employee and the Department of Labor was an ideal much to be desired. Would it not be a wonderful school that would include all three of these factors to work out problems of work and its relation to the life of worker and to the development of a free people? Let us hope for a movement toward this combination of forces, and that when such a movement comes, the employer will be eager to welcome it as the great answer to his needs and responsibilities.

I believe that you, and such as you, even more than the educators of the world are the true guardians of democracy and that you need all science, all knowledge, all wisdom, to help you to understand and perfect this human material with which you are working.

GENERAL DISCUSSION.

MISS SWARTZ: Is there any discussion of any of the papers given tonight?

MR. G. C. WARD, Factory Inspector, New York Industrial Commission: I am very sorry that in the paper read this evening by Miss Van Kleeck she neglects to state something very important and leaves it to be inferred that since 1913 the State Industrial Commission has neglected to do anything to improve the conditions in the chemical factories in Niagara Falls, especially in one factory there. She left it to be inferred that this Commission, appointed by the United States Government, made the survey and inspection last summer and that nothing has been done to improve the sanitary conditions in these places. She neglects to say that while this investigation was being made, extensive improvements were already being carried out, and that a great many suggestions made by the Committee could not be carried out because they were just suggestions and there was nothing in the statute of this state to enforce them. I was very sorry that she did not state, as was told her, that some forty different orders had been made against different storage battery companies and they were already being enforced.

I am saying this because I don't want the idea to go out through the State of New York and through the United States that this Commission is neglecting its duty.

MISS VAN KLEECK: I am very glad to have that statement made and very glad to acknowledge, as I think I did in making the address, that the Industrial Commission co-operated with us in this investigation. I remember the statement that many orders had been given and were being put into force. I also know that since the report received from the Industrial Commission, I have visited that same plant and there are some slight improvements, but still lead oxide is around the floors and in the air and there are workers eating food in the workrooms. I did not see these plants in 1912. I have only read the reports of the Factory Investigating Committee. I don't believe the Industrial Commission would want to say that everything has been done at Niagara Falls which could be done. I tried to point out that something much more fundamental was involved than the enforcement of the particular regulations that we now have on our statute books, namely, that we have got to get a much bigger leverage.

The Industrial Commission had to deal with safety before there was the Workmen's Compensation Law in this State, and yet, of course, we have all recognized that a great deal has been done by the Industrial Commission with the background of the Compensation Law to make it possible. I have said that there is absentee capital at Niagara. You are met there, when they take your orders, with the statement from the manager that they will take it up with the people back of them, moreover with the added statement that there were a number of recommendations made by the Federal Government which were not on the statute books of New York State. The Industrial Commission has been inspecting the plants of Niagara Falls. I still maintain that the plants of Niagara Falls are to-day in a dangerous condition from the point of view of the safety of the workers, and I believe that the Industrial Commission would agree to that statement and would agree also that the bill, which I am informed they are interested in, to extend Workmen's Compensation Law to cover occupational diseases, is absolutely necessary, and that with the present powers of the Industrial Commission there is not sufficient power adequately to protect the health of the workers.

DR. ROSALIE BELL, Medical Inspector, New York Industrial Commission: I should like to refer to the subject of Niagara Falls and the cases of lead poisoning. As I remember, about three years ago there were several cases of lead poisoning among the women employees of a certain factory which were reported to the Industrial Commission. I was sent up from the Commission to investigate. I spent about three days there and I found that I could make quite a lengthy report. I made physical examinations, hemoglobin tests and blood tests, and I found several cases of lead poisoning. Two were out in the care of physicians. I remember inspecting them carefully and interviewing the chemist in charge. I told him I thought that was an unsuitable occupation for women. True, they had been providing them with gloves, but the lead dried on the gloves and I found a great deal of it was on the floor. I told this gentleman that I considered it unsafe and that when I went back I would report that to my Commission and recommend that women be removed from that particular occupation because it was dangerous. I asked them further if there was any other work they could do, and he said, "Yes, armature winding and other such things." When I left there it was quite clear to my mind that women would be taken out of that occupation.

I returned to New York and made quite a lengthy report. I gave quite a dissertation on the dangers of lead poisoning and the peculiar susceptibility of women to it. I quoted eminent authorities. My recommendation was followed and to my positive knowledge women were removed and they have not been employed there since.

About fourteen months ago I began some new work, that is, visiting and inspecting and examining women replacing men in war work. I got my data from inspectors throughout the State and I returned that data to the Department. I would like to read you a short account of my visit to Niagara Falls.

"Statement made May 27, 1918. Factory No. 18 engaged in the manufacture of storage batteries. Number of women replacing men — seventy-five.

"Occupations.

1. Operating machines (punch-presses).
2. Trimming metallic grids.
3. Trimming wooden separators.
4. Inspecting wooden separators.

"Gloves provided for women engaged in trimming leaden grids. Sanitary conditions good, except in pleating room where acid fumes are disagreeable. First Aid Room in course of equipment. Physician in daily attendance. Condition of women good.

"Accidents.

1. Woman operating punch-press had end of finger removed by press.

"Hazards.

1. Acid fumes from pleating room.
2. Chips from leaden grids accumulate on floors and tables and may cause lead dust and thereby expose workers to lead poisoning.

"The women who perform this work are inspected daily by the physician and at present are in excellent health. Trained nurse will be engaged. Lunch-room has been provided for employees. Excellent work has been done by present welfare workers and conditions are vastly improved. Production good. Wages same as that of men replaced.

"Recommendations.

1. Remove all lead dust from tables and floors of room in which lead grids are trimmed.
2. Physical examinations and blood tests should be made of all female employees on entrance and at least once a month afterward. Women employed in room adjacent to pleating room should have their mouths and lungs frequently examined."

MISS SWARTZ: Are there any other questions?

DR. M. A. HAYS, Medical Inspector, New York Industrial Commission: There have been no cases reported at Niagara Falls of lead poisoning for more than a year. That is due to the orders placed as to the gloves and eating in places where lead was used being prohibited. Orders were placed and notices posted, but you know the inspector can't live in the factory and see that they are complied with.

MR. J. L. GERNON, First Deputy, New York Industrial Commission: I was particularly interested in what Mrs. Wolter said relative to women in restaurants and women who work on the railroad. It is true that women in restaurants work in violation of labor laws. It is also true that they work in violation of the hours of labor on the railroad. You want to put the responsibility where it belongs. The restaurant owners and hotel keepers of this State choose to contest the constitutionality of the law. Our counsel is now carrying a case on and for some reason thinks he shouldn't take new cases that we find of violation. The inspectors of this Department have reported many violations of hours of labor in restaurants. Since the hotel keepers and restaurant proprietors, also the railroads, choose to take issue with the law, it is a little difficult. The head of the Railroad Administration said, "What are you going to do about it? You can't prosecute the United States Government," so the responsibility for any illegal hours is clearly that of the United States Railroad Administration.

MISS SWARTZ: Mr. David S. Beyer has a movie which he is going to show us, called "The Outlaw" or "Combating Accidents in the Factory." I shall be very happy to call on Mr. Beyer.

ACCIDENT PREVENTION IN INDUSTRY

BY DAVID S. BEYER, LIBERTY MUTUAL INSURANCE COMPANY, BOSTON, MASS.

Madam Chairman, Ladies and Gentlemen: Some inspiring things have happened since our last safety meeting in Syracuse. Having cleaned up the greatest safety problem with which the world has ever been confronted abroad, we are now ready to return, with renewed enthusiasm, to our safety problem here in this country.

As I have watched the changing lines on the war maps for the last few weeks, they have reminded me of the reply a little boy made to a man who asked him, "Why is it that lighting never strikes twice in the same place?" The boy said, "When it strikes once, the same place ain't there any more." It has been very much that way with the war lines. After the boys that we sent across to do the job for us hit the lines they weren't there any more.

Now we have the problem of safeguarding our industrial armies at home. We have heard the expression used pretty frequently of the "home front."

I wonder if we have thought of the significance of that expression. According to the best estimates available, there were about 35,000 people killed in industry in this country during the last year and that is just about the number that was killed and died as a result of wounds in the war in which we have been engaged, and our Army is the greatest army which we have ever put into the field, so we have a home front quite as hazardous, apparently, as the war front we have had abroad. We might wonder how all these accidents can be occurring and attract so little attention generally. I think the reason is because they are spread throughout so many plants in this tremendous industrial country of ours. In the state of Massachusetts, for example, there are about 30,000 separate industrial establishments, and I presume that a minimum of two or three accidents in each one of these plants would roll up the total tremendously. These two or three serious accidents which occur in each plant do not seem very frequent to us. I might illustrate the impression that they make by a story I once heard of a little boy who went with his father to a grist-mill. Perhaps you have all seen the old grist-mill with the stones which turn around slowly and a little stream of flour trickles out. The boy stood looking at this mill and the miller said to him, "What do you think of my mill?" The boy said, "I could eat the flour as fast as it comes out of that mill." The miller said, "Perhaps you could, but how long could you keep it up?" The boy said, "Until I would starve to death."

That boy lost sight of the fact that this little, thin line of flour, running hour after hour, would quickly fill a sack and a barrel at the end of the day, and he wouldn't get very far with his proposition of eating it. So with our industrial accidents — the two or three serious accidents that happen within each one of our plants are worth preventing, and it is only by reaching them and cutting them down by the twos and threes in each plant that we are going to cut down the tremendous total which piles up when we consider the state and the country as a whole.

We have produced some great results in the operations we have been carrying on abroad. They are results of which every red-blooded American can be proud. How were those results secured? They were secured by cooperation on the part of every one from the Chief Executive of the nation down through the men at the head of our great industries to the employees working in those industries, the women at home and the boys and girls who came and gathered the peach seeds at our doors to make gas masks.

I wonder what the result would be if all that tremendous enthusiasm and cooperation which we no longer need for war against the Hun could be turned around and brought to bear on the war against accidents. I think I can answer what the result would be. Instead of 35,000 men and women being killed in our industrial plants in this country in a year, there would be only 6,000 or 7,000. In other words, it is possible to cut down these accidents 75 or 80 per cent. It has been accomplished in plant after plant of which we have actual records, such as the Eastman Kodak Company, the Norton Company, American Steel and Wire Company, and many others of which we have actual and indisputable records.

The purpose of this meeting is, of course, to interest us and to enlist us all in this war against accidents. I feel sure that it will bring about results in New York, and I wish we might have such a meeting in every state in the country.

Just a word about a film which we will show you, and I shall have finished. The Liberty Mutual Insurance Company, which produced this film, is an Association of about 3,000 employers, with plants scattered throughout Massachusetts, New York, Pennsylvania and a number of other states, and at the present time it covers about 300,000 employees. It was created by the state of Massachusetts for two purposes, one being to give employers protection against accidents at the minimum cost, and the other to make liberal settlements with employees and to prevent injuries to those employees. In the course of each year about 20,000 accidents pass through our hands, so we have an excellent opportunity to see how the accidents occur and what are the real causes. I have often been surprised, in making an analysis of accidents in these plants, to find how few of them occur on machinery. We have heard of the automobile very many times as a producer of accidents. Some one has said that the automobile is dividing all people into two classes, the quick and the dead. You may be surprised to know that automobiles, even in this great state of New York where there are so many of them, injure fewer people in the course of a year than wagons.

In our Massachusetts industrial plants the wheel-barrow is responsible for more injuries than the automobile. Apparently what we need is a speed limit on the wheel-barrow rather than the automobile.

Some one has said that the pen is mightier than the sword. From the accident standpoint, we might say that the nail is mightier than the steam engine. We had somewhere around 2,000 accidents reported last year from nails, with several deaths, and only about 40 accidents from steam engines, with no deaths. So we find that from 50 to 75 per cent of the accidents have nothing to do with machinery, and while I believe that in installing mechanical guards we have certainly found accidents can be prevented, they can certainly be prevented in other ways than by mechanical guards.

We have heard over and over again that a large percentage of accidents was due to carelessness. Perhaps that is true; due to carelessness, thoughtlessness, chance-taking, which is in all of us, many accidents occur.

In an effort to bring before the employees, particularly, the causes of accidents, this play, or this moving picture, which I shall show you after a bit, was produced. It shows King Carelessness getting into the plant with the imps of Carelessness. Each of them causes an injury. They are finally thrown out — Carelessness and all of his imps, as a result of the get-together meeting between the employer and the employees. It shows, in a visualized way, the results that have been accomplished in many plants. This scenario has already been seen by about 150,000 employees, and the reports seem to indicate it is doing at least some little good in influencing them to think "Safety First."

MOTION PICTURE

Mr. Beyer presented a motion picture film "The Outlaw," at the conclusion of the above address, showing some common causes of accidents in industry due to the presence of carelessness, and the elimination of these accidents by the expulsion of carelessness, through the cooperation of employer and workmen.

WEDNESDAY MORNING, DECEMBER 4

PRESIDING OFFICER: HENRY D. SAYER, NEW YORK INDUSTRIAL COMMISSION

COMMISSIONER SAYER: Ladies and Gentlemen: The general topic of discussion this morning is "Infections." Infection is the bane, I might say, of industrial accidents. Last night those of you who were here and saw those splendid pictures that were shown had an opportunity to visualize infections somewhat. The "I-Should-Worry" man with his little scratch and his lost arm is not an overdrawn fancy at all. It happens all too frequently. The humorous part of the picture where "First-Aid-Kit" meets the "Bug" was a splendid object lesson because there is more saving of life and limb in a bottle of iodine than in almost anything you can think of. The procession of the maimed and the halt and the blind that we saw parading through that picture is not overdrawn one whit. If you had the opportunity to sit, as I have sat, day after day, watching that gruesome procession pass before you, you would realize the importance of adequate measures against infections.

It seems a rather sordid thing at times when we sit and haggle over the money value of a hand that isn't fit to look at. Little do we appreciate, in trying to appraise the amount of compensation to be paid for such an injury, what that really means, and how often have I heard — and how commonplace a remark it is — an individual say, "Well, is that all I get? I'd rather a thousand times have my hand back than to have all the compensation that is allowed me." And it is true; there isn't one among us who would swap off our little finger for the amount of compensation that the law provides for it. It seems to me that we do well to consider at a Safety Congress this subject of "Infections." All infections, however, are not disastrous. There is such a thing as a good infection. You know, infection means to acquire a bug that grows, that spreads until the whole body oftentimes, and sometimes the mind, is infected. There is one kind of a bug that we have been here for three days trying to acquire, and I hope that you are all going to get it and get it good, and that bug is called "Safety First." I hope that every person who attends this conference is going to acquire that bug and go away from here infected and that it is going to take and take well. If you will just let that bug of "Safety First" get right down under your skin and propagate, as those bugs do when they get under your skin, until it has spread and until it becomes a part of your being and until you think always in terms of safety, King Carelessness will be thrown out, and when the "I-Should-Worry" man gets it down deep into his mind that a scratch or a splinter or a small injury may result in an infection that will cost a hand or a foot or a life, then the "I-Should-Worry" man is going to appreciate the necessity of taking measures against infection, and he is going to really worry until he has had the first aid treatment and the iodine treatment.

That brings up one point that can never be emphasized too much. It is one that perhaps I have the bug about, because I seldom address a gathering considering industrial matters without mentioning it, and that is the necessity of workmen giving notice to their employers of injuries. Hundreds upon hundreds of cases of serious infections, accidents resulting in serious infections, deformities and defects, have been disallowed, have had to be disallowed because the workman thought it was so slight that it was not worth while mentioning, and he kept it to himself, or he did as the man you saw in the picture last night — he put a quid of tobacco on it, paid no attention to it, made no report of it, and later, when it came time to prove that he had received an accident in the course of his employment, there was no proof of any such accident.

The law has been amended in that respect in the past year, so that the former ten-day period of giving notice has been extended to thirty days, but that will not meet the situation unless the workmen who are injured give notice of their injuries. It is a point that, it seems to me, the representatives of labor, of the organized working men and women of the state, should carry home with them and should never lose an occasion to place before the trades unions whom they represent. It is a most important thing, and it is a sad thing, to see a man crippled for life go uncompensated because of his failure to do a little thing — a thing so easy to do but which so often is not done, that is, giving notice to the employer.

Perhaps I have transgressed the rule that a presiding officer's business is to preside and not make a speech, but as a time filler perhaps it has served a purpose, because I have noticed people constantly coming in, and I hope that everybody will be in by the time the real speakers of the day begin, because we have some speakers here this morning whose experience, whose knowledge of their subject, justifies our confident expectation that they will tell us some things of very great and real value about industrial infections.

I have great pleasure in presenting to you the first speaker of the morning, Dr. Shoudy, Chief Surgeon, of the Bethlehem Steel Company, who has made a study for many years of industrial infections and who will present a few facts for our consideration.

INFECTIONS — THEIR CAUSE AND EFFECT

By Dr. L. A. Shoudy, Chief Surgeon, Bethlehem Steel Co., Bethlehem, Penn.

Ladies and Gentlemen: Sometime ago I was asked for a paper on "The Prevention of Infections." Now you have asked me to talk on their "Cause and Effect." Some day, somebody will have me say something about the treatment and we will have covered the whole ground.

I hope that you will appreciate that it is hard, from the doctor's standpoint, to get everything before you in a way which we can all understand. I am going to attempt to do away with any scientific discussion of infections, their cause and effect, and talk to you straight out as I feel that we should talk about these things to one another.

As you know, Varro may be called the father of infections, because he was the first to teach that infectious diseases were caused by micro-organisms, but our real knowledge of infections comes with Pasteur and Koch. Koch's postulates are accepted, and from these are all our bacteriological deductions made.

Infections are of many kinds and act in many ways, and likewise do we find various causes and effects. All that is needed is the " bug " and a susceptible host and the infection follows.

To the average mind infection and blood poison are one and the same; this is not true. Don't let your men get the idea that every little infection they have is blood poison; don't let them get the idea that their blood is out of order and that is why they have a boil. Teach them that these things are infections and nine times out of ten are due to one and only one cause — carelessness and neglect. All infections are *not* blood poison. The term " blood poison " should be used only when the actual condition exists. An infected finger should be called such and not called blood poison.

The surgeon, the pathologist and the hygienist do not all view infection in the same light because their view-point is different. For the pathologist, the mere presence of bacteria does not constitute infection; for him these bacteria must grow, diffuse their products and produce a reaction. For the hygienist the mere presence of the organisms, as in the water, air, etc., constitutes infection.

Let us for the time be pathologists and surgeons and take Adam's definition that infection is the interaction between the organism and the microorganism. The cause of infection, then, is in one word — " bugs," " germs," " bacteria " or " microbes."

The old saying that it takes two to quarrel is true of infections; you must have the invader and the host.

Different germs act in different ways, and accordingly the cause and effect vary. Some are systemic, some local, and there are those who say that all infections were at one time local.

Do you know that infections are of so vast importance that to remove them would be to rob the doctor of his job? And do you realize that this is what the doctor is trying to do? And, at the same time that he is trying to prevent infection, he is trying to save human lives, and you who are connected with the industries of your great commonwealth are trying to save and repair human machines that they may be better able to carry on their work.

Have you men ever stopped to consider your plant physician in the light of the master mechanic of your factory? He is; his job is to repair human machines; and you men from the shops can throw your broken parts into the scrap heap and they come out new. Not so with us. If you spoil a job, you say " Scrap it." The human scrap heap of industry cannot be thrown into the melting pot and come out anew.

Infection! Infection! Men, that is the biggest thing in medicine. The cause — the effect. Put aside scientific discussion as to names, terms, modes of reproduction, manner of action, etc., and follow me through industry's gate and let's see the cause and effect.

Have any of you men stood at the gate of your shop or factory in the morning and watched your people coming in? You say, " Here's a big, healthy man going into the shop, and here beside him is a fellow who looks haggard and worn." Traveling right on the heels of your big, healthy man and right on the heels of the little, puny man, is a little thing that may cause the end of either one of them. What is it? It is a microbe — ever present and always ready to do its job. Your big, healthy man goes into the plant and goes to his work. The little Mr. Microbe comes along and sticks him. No effect. Why? Because he has good health. He knows how to live clean and eat right. Take the other man who has been out the night before, who dissipates, is not in good health, is run down. Little Mr. Microbe comes along and attaches himself to him. He smiles and says, "Ah, I have found a place to carry on my work."

Suppose the microbe is pneumonia or tuberculosis. He finds a resting place in the man who is susceptible, who is haggard and worn, who gets no sleep. He goes through the shop spreading more microbes to the other people. What happens? The microbe may affect five or six or seven or eight men. That has been driven home to you recently. If it is bacillus influenza which has caused all the trouble, look what we have lost. It started, came to our shops, affected perhaps one, two, three, and my God, where has it ended? Not yet! Infection, the cause, the effect and the result. Over 80,000 people that we know of and over a thousand doctors have lost their lives — infection, the cause, the effect, the result.

I wonder if any of you have looked over the work that has been done by fatigue. I wonder if any of you have ever thought over the results of improper care of the body. Men should be taught to take care of themselves. Your body is a machine. There are waste products that must be given off; there is fire and fuel that must be supplied to run that machine. If you are pouring into that body the fuel and fire and not taking away from that body the waste products, what develops? Putrefaction, exhaustion, injury, infection, the cause, the effect.

Let this little microbe that followed the man into the shop be other than tuberculosis or pneumonia. For the sake of hygiene give him another name. Let him be bacillus of typhoid fever. You have heard of typhoid carriers. Let this man in some way or other, in your cafeteria, or some place where you have the common drinking cup, implant typhoid fever — the bug, the fever, the cause, the effect, the result. The infection from typhoid fever is not only that you see the man sick, but you have other things that follow in its wake — bone conditions, abdominal conditions, mental conditions — the cause and the effect.

This brings up the ways and sources of infections. How do they travel? This class of infections can be air-borne; water, soil, food are carriers and there is infection through animals. There are some borne by water that are killed the minute they are dried. There are others that dried any way they come are still viable and can cause trouble. There are those that require a small amount or small current of air to carry them around. There are those that are off with the slightest breeze. Air is very dangerous in spreading infectious diseases. You have only to look at what is going over this country to bear that out. Water-borne are typhoid and dysentery; soil-borne are tetanus and anthrax; from your food there is no end to infections; insects that carry infections are fleas, bed-bugs, mosquitoes, flies and rats. They are all infections themselves — all with an effect, and they all come back to industry. You may not pay compensation on all of them, but you will pay compensation on some of them. You find a man who probably neglects himself; he gets a bump in the side; he forgets it and in a couple of days he has a hitch in his side; he forgets that, too, and in a couple of days he dies from pneumonia and you pay compensation. Your state has paid compensation on such cases.

In some states men claim they get typhoid fever or pneumonia from a drinking fountain supplied by the companies.

The thing to do is to teach the men what health means, to hit on all six cylinders every day and to be able to ward off infectious diseases.

In order to do harm the little microbe must have a point of entrance. Nature has provided us with a wonderful machine, but we do not always keep that machine in proper condition. If the microbe enters the throat, there is tonsilitis, rheumatism, stiff joints, lumbago,— tonsilitis, rheumatism, cardiac diseases,— tonsilitis, nephritis,— severe kidney trouble.

The point of entrance may be through the teeth — and my goodness, what they have laid to those poor teeth! I picked up a paper the other day and read where they laid a man's mental condition to his teeth. They took out all of his teeth and he wasn't crazy any more. You all know and appreciate that a great deal of the trouble that we have been unable to lay our fingers on has come from the teeth. You can all think of two or three cases where the teeth have been at fault. From an abscess at the root may come any kind of serious trouble.

There are many of the different infections that bring a direct effect that are not directly related to compensation, yet they are related to industry and to your people and to your working force. You must take some notice of them and try to keep your working force in the best condition possible.

While microbes are the ultimate causes of infection, there are many important etiologic factors relating to the individual exposed to infection. I spoke of susceptibility. The animal body is possessed of various defensive mechanisms and the condition of these affects resistance or susceptibility.

Wounds, necrosis, hemorrhage, alterations in the secretions, trophic disturbances, may open the door for infectious organisms; at the same time they may lessen the physiologic resistance of the part involved. On reaching the interior of the tissues, microbes encounter normal defensive mechanisms, of which phagocytosis and bacteriolysis are best understood at present.

Coming to that type of infection, which is best understood by the names or terms such as boils, infected fingers, wounds, etc., we must know that the principle is the same. Injury may be the primary cause, but if there were no microbes present, then there would be no infection. There we get our old friend on the job — Indifference, Don't-Care, Take-a-Chance, Carelessness — there is the cause for your infections. You can name your bug whatever you want to; he can belong to any family that he wants to, but carelessness is the greatest cause, from the industrial point of view, of all your infections.

Microbes are always "Johnny-on-the-spot." They are everywhere — on your hands, in your mouth, in the air. So long as there is no point of entrance, there will be no infection.

We are not to discuss the how and why of infections. I am glad for that.

Microbes are of various kinds. Give them whatever name you want to — streptococcus, staphylococcus, tetanus. Mr. Workman will be the host, Mr. Microbe "Johnny-on-the-spot," Mr. Carelessness the cause. The workman cuts his finger, snap goes the machine, the skin is broken, the point of entrance is established, the man's finger is infected — cause and effect. As soon as the finger is cut, Mr. Microbe gets on the job. If there is any resistance at all in the body, it starts to work. Immediately the white blood cells, the policemen of the body, rally to fight Mr. Microbe. The bugs multiply; the big battle goes on. Whatever is dead piles up and is called pus. The force is concentrated around the point of entrance or localization of the infection. If the blood and the serums that give off the bodies to fight the infection begin to lose ground, the infection begins to travel. It may go up the arm in a little streak. Why? Because in this wonderful machine of ours there is a little chain, a little subway, a little channel, call it the lymph, if you please, that leads up the arm. There is a little station at the elbow and one under the arm. The first thing you know there will be pain there. What is it? It is a warning. A little scratch may eventually mean the loss of an arm. You may fight it in any way you wish to; your treatment can be anything that you want, you sometimes it will get the best of you because you don't get a fair show at the start. A little scratch, if it goes by way of the lymph, may end — God knows where! It may go through and around the tendons. You fellows who have been around the plants have seen workmen with fingers that they couldn't pull down. At some time the workman had an infection in there and the tendon sheath was destroyed. It may not have stopped with one finger; it may have gone into the palm of the hand or up into the wrist. It may have settled in the wrist and in that event the wrist would be no longer of value to the workman. It may not have stopped there; it may have gone into the shoulder; the entire shoulder may be gone and the arm withered — all from a little carelessness.

I said to you that infections may be systemic; they may be local; they may be general. If they are from a local standpoint, the effect may be pain and recovery — complete recovery. If not, it may be as I pictured to you — a small injury and the result — the loss of a part or the stiffening of a hand. Tendon slough is one of the hardest things for a surgeon to control, and it is one of the hardest things, after it has occurred, for a surgeon to remedy.

Commissioner Sayer has told you that they say when they come before him, "Is that all I get for that hand?" I know he feels like telling them, "You should have thought, my dear man; you should have come when you had the first small injury."

Prevention is the biggest thing; if you can only teach the men to come to you with the small wounds, you have done something truly worth while. Education, after all, is the biggest propaganda that you can possibly get throughout the industries.

A man may have gone through the plant; he may have stepped on a nail. Perhaps it was a clean nail and he thought, "Oh, well, that won't hurt anything; I'll let it go." He gets away with it. Another man may go through some part of your plant and step on a nail; he is not so clean as the other man. He, too, lets it go; he doesn't pay any attention to it. He may suffer from that negligence.

The man at the open hearth or some other part of your plant may get a little scratch on his hand and think nothing of it. Three or four days later his wife may call in the physician because he can't open his mouth. The microbe was there; tetanus developed and the undertaker gets the job.

Another thing hard to drive home to the workman is that not always are you able to see your wound. You men can remember your college days when you played football and when you got some severe bruises that couldn't be seen. There would be no break of the skin. The trouble in those cases comes from the inside. Big blood clots develop. Four or five days later the temperature begins to go up; there is infection from the inside. Bruises, contusions, or whatever you want to call them, are just as bad as anything else when they are severe.

Some of us — maybe all of us — carry around in our systems somewhere the bacillus tuberculosis. It only needs a little something to help it on and then it starts work. I have known of a case where a man in play in a shop just lightly kicked another fellow in the back. The man who was kicked is now absolutely worthless. Tuberculosis developed. The bugs were present and all they needed was a little blow or something like that to destroy the man's vitality. He was susceptible.

Another point where there are many infections (I don't know how many of you are bothered with this) is the eye. In the years gone by there used to be what you called the handy man in every shop. If a fellow had something in his eye, this handy man would back him up against the wall, turn up the lid, take out a match or a toothpick, chew the end of it, and take out the particle. If it isn't loss of time to the injured man, it is the loss of an eye; the loss of an eye will mean some loss of time, also.

You all know that probably there is no other place in the body where there are so many bugs and different kinds of bugs as in the mouth. What more do you want to encourage infection than to stand up against the wall and let a fellow chew a match or toothpick and remove a foreign body where there is a break of skin in the covering of the eye? Some of these handy fellows go so far as to have a little piece of steel very carefully ground down to a point which they use. They pull it out of their pockets — full of bugs — infection — loss of the eye. Men, eyes are wonderful things, and they should be taken care of.

As to the source of infections — microbes are always some place — it makes no difference where you are working or with what you are working — oils, chemicals, leather, tin, brass, or what-not. Cutting oil in the mills, during the last two years, has been one of the biggest problems you have had to contend with. They have inspected the cutting oils and tried to take out the infections, but the infections were not in the oils; they were on the men's arms. The little particles of steel would come through the sleeve; the fellow would rub his arm and rub a hair from the epidermis; the particle would go in and infection would come.

Infections are not all bad. There are some with good results, but the ones that cause you men to pay out compensation, the ones that cause the misery, the ones that cause loss of arms, hands, fingers, legs and lives, are bad. As I told you, I think that carelessness is the biggest cause of all your infections, just as it is the biggest cause of all of your accidents. Take Neglect, Indifference, I-don't-care, Take-a-chance, backed up by carelessness, and you have got your infection. It makes no difference how it travels —

by limb, by tendon sheath, or how,— it results in a crippled hand, the loss of an eye, a crippled arm, the loss of a leg or the loss of life.

Many of you men are connected with industry in various ways. You are safety engineers, welfare men, and you are doctors. I wish that I could send you home infected. I wish that I could infect you and send you away deeply infected with a big bacillus, and I hope that your resistance is low. I know it is by this time. I wish that I could send you home infected with the bacilus humanitarius, the microbe of love for your fellowmen. If you are fully inoculated with this bug, there is not a man in your plant with resistance sufficient to overcome you, and you can watch your own cause and effect.

COMMISSIONER SAYER: I am sure that we have all reaped a great deal of good from Dr. Shoudy's paper. It is a subject that cannot be dilated upon too much. Dr. Shoudy, as a surgeon in one of the greatest plants in the country, has had a great opportunity to observe infections in his own plants among the workmen over whom he has supervision. We are going to have a discussion of Dr. Shoudy's paper in which I hope you will all participate. That discussion will be led, however, in the beginning by another authority on infections, one who observes infections not so much in their primary stage, not so much the little scratch that is so easily taken care of, but who observes them after they have ripened and developed into well started cases, who observes them not from the standpoint of the employer, but from the standpoint of the impartial observer who is advising the Industrial Commission.

I don't suppose that any doctor in New York City, I might say in the United States, has had a wider field of observation of infections in the past four years than has Dr. Lewy, Chief Medical Examiner of the Industrial Commission. I take great pleasure in introducing Dr. Raphael Lewy. I might say that Dr. Lewy wanted to know how long I was going to let him talk. Well, he is here, and I am not going to set any time limit on him.

INFECTIONS

BY DR. RAPHAEL LEWY, CHIEF MEDICAL EXAMINER, NEW YORK INDUSTRIAL COMMISSION

Mr. Chairman, Ladies and Gentlemen: If you were to hear fifty surgeons discuss the subject of infections, although they might agree on the most important points, they would present this subject in various ways. Before I discuss the subject *per se*, I will avail myself of the opportunity to tell you that it was my personal fortune to have spent my first ten years with two of the most eminent surgeons of international reputation, I may say, whose work I have seen as a pupil, as an assistant, and later as an associate.

I have a very excellent recollection of the very terrible deformities that I have seen in the hands even of such masters as they, and they made a very profound impression, so that as a young man I endeavored to analyze the causes of these terrible defects. I have for twenty-two years attended daily two of the largest clinics in the City of New York, where my department, I may say, specialized in infections, and in my most immodest modesty, if I may use this term, endeavored to study them from every point of view. I have studied my own mishaps and my own mistakes and have later on changed my treatment with some better success than I have seen by some of my colleagues.

With these preliminary remarks I shall speak on the subject and divide it into the scientific bacteriological part and the clinical surgical part. I shall sub-divide it later into pure surgical disability and into ultimate vocational disability.

Micro-organisms, as the name implies, are bodies not seen with the naked eye and are only seen with the aid of the microscope. They are with us, on us, in us, around us, at all times, and I may tell you that certain micro-organisms are a necessity. If micro-organisms are in us at all times, what prevents them from doing their mischief? Nature has provided a natural resisting power. Whether you call this depending on hereditary tendencies, or, as the old teachers used the term, a predisposition or a diathesis, it is sufficient to say that the blood, with its ingredients, namely, the serum or white corpuscles or leucocytes, is our defender, just as much against a local infection as against a systemic infection. In fact, the manifestation of disease in its various degrees is the indicator between the fight of nature's forces given to the human body against the micro-organisms which either enter from without or from within.

I may also tell you that micro-organisms are distinct living bodies which differ in their contour, in their structure, in their consistence, in their affinity for certain substances upon which they live, namely, the soil, in their toxines that they give off in virtue of their life, either ptomaines or toxines. They differ in their very living by changing the color of the medium, by changing the consistency of the medium, so that some bacteria liquefy solids, solidify liquids, change colors, give off certain distinct odors, and upon these qualifications can we distinguish one from the other. They are highly developed bodies. They act differently. I beg to differ on this point with the preceding speaker. I do not believe that all bacteria are alike.

I should also like to differ as to a certain point of negligence. In this unfortunate virulent influenza the very strong men with good resisting power were the ones who got it and were affected seriously as were the others, and it did not affect the old people. That is a fundamental law based upon bacteriological knowledge. That resisting power does, however, play a very important part. There are some infections which, if they were treated from the very moment of incipiency, would leave deformities. There are some infections which, if they were seen at the moment of their occurrence, would form systemic infections or general septicemias.

Having referred in some way to the laboratory aspect, to the scientific aspect of bacteria, I shall now refer to the clinical surgical aspect. I may digress here for a moment to call your attention to those parts of the body which are most liable to infection, and if you permit me, I shall here take advantage and speak to you on accidents at large. Do you think that accidents are based upon some fundamental laws or do you think that they occur without rhyme or reason?

When I entered the Department four years ago, it was impressed upon me that there was very little written in this country upon traumatic injury.

The only book of any account was a translation of a foreign text. The human mind is only called upon to do something after an event occurs. The event must come first. The human mind endeavors to analyze, and by mental or laboratory process or analysis it arrives at two factors. If the event is obnoxious, we either endeavor to find a preventive to prevent its recurrence, or, if we cannot do that, we endeavor to find an antidote to destroy it.

Before the compensation law was in existence if you had asked a surgeon what he did with his infections or his fractures, he would have said, "If an infection comes in, I cut it, I drain it, I bandage it up and I am mighty glad if I don't see it any more." If you ask the old surgeons what they do with their fractures, I am going to tell you how they would do. If an unfortunate man had a Pott's fracture, he was put to bed and the house surgeon put on an appliance according to his own idea — a box extension. In a case I remember, it was on for two weeks, and at the end of that time, McCarty, the injured fellow, with the aid of a few crutches, was walking around limping. The surgeon in the hospital said he needed McCarty's bed for another patient and he let McCarty go, telling him to come back for the outdoor department, and giving him something to put on his wound. Then McCarty after a while would get disgusted and say, "I'm sick and tired of that clinic; I'll go to the Bellevue or the Vanderbilt." But the surgeon who had seen McCarty first congratulated himself that Mr. McCarty had a fracture, that the bones had united and Mr. McCarty's stiff ankle joint didn't bother him any more. That was the border line between the surgical and the vocational disability of which the surgeon did not know until this law compelled him to analyze it. I don't mean to say that he was a far abler or worse surgeon before the law, but there had to be an event to stimulate him so that he analyzed, and in consequence of his analysis made himself new laws, and he has got to abide by them.

I want to go on record and take this blame upon myself. I am mature in age and I have seen as much as a good many others. It won't harm the medical profession to admit their limitation in knowledge. It would be a mighty good thing if they did. I often have said that honesty is not a qualification; it is only a qualification to a congenital crook.

Having given you an idea, I shall lead you now into the field of industrial infections. I recall, as an academic student, that a teacher whom I highly respect in his first lecture on zoology said, "The monkey differs from the human man in that he cannot oppose his thumb to his fingers." You know the monkey's thumb is far back and therefore, he cannot make a fist, the emblem of the educated two-legged beast. That is why we are superior to the monkey. The fist is the emblem of civilization with which we have accomplished so much. I mention this to you because this opposing thumb predisposes him to various things which become in life unfortunate. Just analyze, without the conception of a medical mind, how we manipulate our utensils and instruments. I believe that in the most primitive man, if my knowledge of anthropology serves me to an extent, I see his stone hammer, I see the miserable fist that he made. In my opinion, that must have been the first implement that he used, and he used his hand with it, and in using his hand he exposed himself to certain injuries.

With your various vocations, with your accomplishments or various mechanical appliances, you have predisposed and increased the source of injuries. I may go on record and make the statement that the smaller the wound, the more minute the wound, the more virulent and severe is the infection. I have, during these many years, never seen a very severe systemic infection from a large cut with the edges open. I have seen a local infection, a purulent infection, but I have never seen the so-called severe systemic infection from a large wound that we see from the minute wound.

Where are the minute wounds? Generally at the tip of the finger. Who sticks himself there? A person who works with sharp instruments, mostly needle workers. Who have the most virulent infections? Needle workers, tailors, men who use pointed knives, tin workers, women who scrub the floor. Refer to your subject and see that these remarks are absolutely confirmed by large clinical observation.

I will speak of three infections of the hand. The first infection, which we so often see and which we see daily in large clinics, is an infection which we call paronychia, which is generally around the nail-bed on the surface of the finger. I have often said to men who work with me in the clinics and men with whom I have been associated, " If this infection results in any complications, it is attributable to the bad surgery." And I have never retracted that statement. The paronychias ought to heal without any defect at all. Those are the infections, as I say again, on the dorsal surface, that means, the posterior surface around the nail-bed of the finger, most often seen among women needle workers.

In contradistinction to this very slight infection that I spoke of just now, there is the infection which is called, in ordinary terms, a felon. Now, let me just give you a clinical picture of how they occur. I may emphasize here how I differ with some of the remarks of my colleague who has attributed so much to negligence. A person receives a very small punctured wound; either with his immediate knowledge it bleeds or is very slight without pain. The one who has this punctured wound with bleeding is aware that an injury has occurred. Naturally, a human being of the ordinary type sticks his finger directly in his mouth. I want to go on record that the saliva of the mouth will not infect that wound. That is not the way they are infected. They are immediately infected by the very implement which causes the wound. If this were a large wound which bled for some time and the edges were to remain open, the infection would be very slight because there would be drainage. These punctured wounds are most often at the tip of the finger, not in the center nor at the base; it is always near the tip where we have no tendon attachment. The tendons of the terminal phalanges, that means at the ends of the bones, are attached at the bases, so nine times out of ten the wound leads down to the phalanges. Within a day or two the finger swells and throbs; it is painful. The patient goes to a surgeon, and if he is able in his vocation and a specialist, he makes a deep incision down to the bone. If he does that, one of two things will occur. I may go on record and state this as a positive fact, that the worst that will happen will be a necrosis of the bone with an ultimate infection in the bone and an ultimate suppuration of the bone either of part or of the entire phalange.

I have never seen, after adequate treatment, this infection spread upward, not from the terminal phalanges. Therefore, the deformities in consequence of felons should be, to the maximum extent, only the loss of the distal phalange, and if not an ankylosis, a stiff distal phalangeal affection.

In many cases in statistics I have noticed one complication which I haven't seen since I came to the Department, and I have not as yet been able to give a logical reason for it. If an infection occurs in men above fifty years of age, although the infection has not extended either by continuity or through the circulation or lymphatic channels, they get a marked change in their shoulder joints; that means that when the infection has held with its ultimate effect, they have a limitation in mobility of the shoulder.

I have endeavored, by some analysis, to find the explanation, and I have thought, as the doctor said to you before, that they may have dormant systemic infections, that is, infections in some dormant state which are not active. I haven't any clue for this hypothesis as yet, but I have proof that it is a clinical entity.

In my Department the men associated with me, when they examine a finger, will examine the man's shoulder if he is fifty or above, and we most invariably find the condition I have mentioned.

I spoke to you of an infection at the back of the finger, an infection in front of the finger — both of them local, and I can speak now of a very unfortunate infection. I must give you a slight conception of the anatomy of the hand. All these fingers that flex are flexed by three tendons, one tendon which goes to the thumb and is called the flexor longus pollicis, and, as the name implies, it means the long flexor of the thumb. Of the other two tendons, one is called the flexor sublimis digitorum, and it means the upper flexor of the fingers. The third is the flexor profundus digitorum, which means the deep flexor of the finger. All of these are made for the purpose of flexing the phalanges of the fingers. They are covered over by a synovial sac, a very delicate membrane for the purpose of protection over the tendons, containing a synovial fluid to prevent friction while these tendons work all the time.

Nature has done something very peculiar here, and at the same time it is a great disadvantage to the unfortunate workman who is injured. This delicate membrane covers all the tendons until it gets to the palm of the hand, the metacarpal region. It ends here in a blind pouch with the exception that at the thumb and at this little finger it sends out a long process which covers these tendons. I want to go on record here and tell you gentlemen that every punctured wound which occurs in consequence of a sharp instrument in the flexor surface of the thumb and in the flexor surface of the little finger is in itself at the time of the injury a permanent deformity, and I want to see one case that is different. Those are the cases to which I referred in the beginning of the terrible results that I have seen and could not remedy, with one exception — that in later years — in the last few years — I have had better — slightly better results.

I have explained to you that in this injury the tendon is low situated, and, therefore, you get your injury down to the bone.

The wound which is minute immediately affects that part of the sac that I told you about, and as the infection is deep-seated and has no outlet, it travels immediately up the arm, and, as I explained to you, the patient comes to the doctor after two or three days with local infection. The picture there is different entirely. When I think of it, it is a nightmare to me. I shudder when I think of the terrible results that I have seen in unfortunate cases.

These infections, I may say, from a bacteriological point of view, are most often streptococcus infections, and I have enumerated in my paper on "Infections" that they are always due to a pointed instrument and occur ad seriatim in three classes of people. First: Tin workers, men who work on tin and with a sharp piece of tin hurt themselves. Second: Men who work with fish knives — pointed knives. The fish knife seems to be extraordinarily virulent. Third: Scrubwomen who get splinters in their hands.

I am going to show you the clinical picture of an unfortunate patient of that kind. A man comes into the office within six hours after the infection with all of his fingers stiff. He says, "I stuck myself." You examine the place of injury; you can hardly see it, but if you try to open his fingers and he is a big fellow, he will tell you something or do something. In six hours after the infection you have an involvement of the entire synovial sac. Nature protects itself and the fingers contract just in that position. Now the question arises, "What am I to do?" If you refer to the older surgeons, they always say, "Cut down immediately." I remember in my earlier days my teacher would take the knife and rip the hand all the way up, but how that patient loved him afterwards! And how he loved us assistants who rebandaged him, and I didn't blame him either.

What occurred was this: Although this unfortunate individual who was injured had an infection, there was no pus as yet. Pus does not form as early as that, and certain bacteria do not form pus as early as other bacteria. The staphylococcus differs from the streptococcus in its local manifestations. One may be more virulent to the system, but one is better for the local infection; it breaks down quicker and forms pus. After this terrible cut was made, the unfortunate patient suffered agony and something else. A few days afterwards the surgeon would say, "There may be a deep pocket there; we'll cut it." He would cut again and wouldn't find any pus. About eight days later local pus would form deep in the palm and then the unfortunate man was relieved, but this was what he had — permanent ankylosis.

Evidently some of our mothers knew something about surgery, too, and I am going to expose myself to a terrible criticism by my colleagues, but I will stand it, for to my own satisfaction I have proved it is good. After seeing these very bad results in my own work as well, I argued — maybe we ought to wait until pus forms. Just about that time word came out about Behr, the great surgeon; he did something in a scientific way that our old mothers used to do at home without knowing anything about the scientific side of it. The old mother would go and put on a hot linseed poultice and that would draw and make an abscess. She didn't know anything about phagocytosis and bacteriolysis and all that kind of thing and she didn't care to know about it; she simply did that and it was good. This great surgeon did that on a scientific basis, on perfect surgical research. He put on a tight bandage, a tourniquet, and by doing so he interfered with the circulation, and as he interfered with the circulation, first the blood rushed in and then there was a stoppage. Wherever blood is interfered with in its current, in its circulation, certain changes go on and the important change is that the corpuscles or the corpuscle elements, by the power of penetrating the wall of the blood vessels, go into the field of infection, and that is what the preceding speaker explained to you — the power of the white corpuscles to destroy the infectious bacteria.

Behr did this in a scientific way. I have used Behr's treatment to some extent. In my hands it was not as good as the literature stated, so I have gone between both treatments, and in my newer treatment of these terrible infections, I would put on a wet dressing and apply heat in the shape of hot water bags, and instead of, as in former years, cutting immediately without any results, I would wait about four or five days. The agony of the patient is severe, but when I cut and find pus I do not give him this terrible deformity, but I give him an ankylosis of one finger. Nine times out of ten he has an ankylosis of the thumb.

In the Department I have seen the most terrible deformities, and I will show you some slides. In former years when an old surgeon, who was not a well-wishing fellow-colleague, would see a case like that he would say, "Who was the doctor?"

"Dr. So-and-so."

"Well, why didn't you come to me? Why did you go to him? If you had come to me, I would have prevented that."

The fact was that he would have done worse than the young doctor.

I have heard that so many times, and in my lectures before my student class I tell them, "Gentlemen, if I contribute nothing else to you, I want to tell you one thing — do not take that bluff from the old men." It takes a far abler surgeon to know when not to cut than when to cut, than when to first cut in order to make a diagnosis. He may be called a conservative surgeon — that fellow — but I'd rather have him say, "I am not going to cut," than to cut open an abdomen and find nothing.

I wish now to call your attention to the border line between your surgical disabilities and your vocational disabilities. All that you can expect of a surgeon, if he is competent, is to alleviate the individual's pain, to eradicate the pathological conditions from which he suffers, and that is all he can do. The patient comes to you as a deformed person with a partial ankylosis or complete ankylosis of the hand, elbow or shoulder. Now comes the question, "Can we rehabilitate or reconstruct that?" There is a certain work in our surgery which we call tendon plastic, which means the reconstruction of retracted or contracted, adherent or lost tendons. Surgeons have an idea that when a hand is contracted and the contraction is due to a growing together between the external tissues and the underlying tendons, you can cut down, loosen that up and the fellow can move it again. Theoretically that sounds very good. But I have not seen very good results after tendon plastic. I say the surgeon should be more careful in his prognosis, in his statement as to a complete reconstruction of the defective parts.

Why we do not see very good results is this: If a hand remains in a given posture either in the extended position or in the flexed position, although there is no involvement of joints in consequence of the infection, this posture itself in time will cause secondary changes in these joints, so that even should the surgeon be successful in his plastic, that means in his reconstruction of the tendons, he hardly can overcome the defect in the joints, so the patient's hands are to some extent at all times partially or permanently deformed.

Before conclusion I want to say to you that if every workman were to be examined every morning, every noon and every night, and if the surgeon who examined him were the most competent man in existence, and if the aseptic and antiseptic solutions were the most chemically perfect, some infections could not be avoided either in their occurrence or in their complications.

Of course,, I believe that a workman, if honest, should report his accident immediately. I believe that every plant ought to have a surgeon in attendance at all times and *not* nurses. I believe that there should be adequate facilities immediately at hand for attendants and assistants, but at the same time, the surgeon who is experienced should tell his employer or his corporation, "Gentlemen, there are certain infections which are neither due to any negligence nor are some of the defects due to the mistreatment. Their cause is not known to us."

Having finished now with reference to these terrible local infections, I shall speak to you about three infections which are of importance to the workman, namely, syphilis, tuberculosis and cancer. I don't want to tell you how many people are syphilitic, but one of the great authorities of New York in a lecture said as follows:

> Gentlemen, I am going to console you. Most of you have tuberculosis. That, gentlemen, has been proven at the autopsy table by two of the greatest pathologists. About 70 per cent of all the autopsies of individuals who have died from other causes have shown tuberculosis. Most of us have tuberculosis; some of us have a little syphilis and the rest of us have cancer.

What is syphilis? Syphilis is a systemic disease; that means a general poisoning of the entire body in consequence of a local infection, wherever such infections may be. I don't know why a person who has syphilis is ashamed to tell it more than a person who unfortunately has a cancer or tuberculosis. I'd like to know what person has a special affinity to get syphilis or cares to get it, and at the same time it is the confounded outrage of society that you will sympathize with a person with tuberculosis, but because he or she has syphilis they are outcasts.

From an industrial point of view the subject of syphilis is of great importance. There are thousands of people who work and go about who are apparently healthy who have syphilis, a systemic syphilis, without any local signs whatsoever. When do we know that they have syphilis? Take the unfortunate man who is hit on the head with something. It isn't very severe; it's an ordinary scalp wound; it is sewed up, heals, and four weeks after he comes and says:

"Doctor — headache, headache, everything turns."

"Why, you only had a scalp wound. What are you doing with headaches?"

"Yes, but I have them." The doctor examines him and says, "Well, your blood pressure is a little over 150 — a little too high — maybe from your heart."

"Never had heart trouble before, doctor. I've been a longshoreman and worked hard all my life." He goes to another doctor. The doctor says, "Are you married?"

"Yes."

"Children?"

"No.

"Ever have any?"

"No."

"Did you ever have so-and-so?"

The fellow may be bashful and try to deny it; then he says, "Yes." The doctor says, "Let me take your blood pressure." He takes the man's blood pressure and then the answer comes back, "Four thousand plus, Wasserman positive. He's got syphilis."

Suppose he has; he's forty-five and never been bothered with anything until somebody knocked him in the head. When he was knocked in the head, he unfortunately called into play a disease which was in a dormant state. He had that disease all the time, but he had sufficient anti-bodies to counteract it. You see, nature is kind. Nature knocks on one side and then she puts something on the other side to counteract it until the knock of the head comes along and everything's gone. That very knock, which might have occurred to ten other individuals and had no sequence whatsoever, got this fellow. He had a lowered vitality and along came Mr. Spirocheta, the germ of syphilis, and said, "How-d'you-do?" That inactive spirocheta, for thirty years in his system, finds now a place either in his meninges or his periosteum and says, "How-d'you-do? I'm here and I'll tickle you first and give you a little headache and see what happens. If you are not satisfied with that, I'll give you a little vertigo, and if you are not satisfied with that, in a year may give you something else, and that something else is paralysis."

I think I have had a chance to, or I mean I was compelled to, stand the blows of some of the ablest men in New York City on the subject of syphilis and its complications. I remember a discussion with one of my ablest colleagues for whom I have the greatest respect and whose knowledge I esteem highly. I remember very well on the pathology of the paralysis which occurred two years after the injury, I attributed it to the injury. I wanted to go up to the Academy and get an article, citing something parallel to it. After searching for a while, I had to look at the fine literature, and there I found the exact things — that after the slightest injury in syphilis, anything can occur, and if it does occur, gentlemen, whether the man has that syphilis six years or thirty years, if up to the time of the injury he was a useful workman, he must be compensated for it, however slight the injury may have been, if you can conscientiously look upon it as a sequence of the injury, although he had syphilis before.

It is a most peculiar thing that when a bone doesn't heal, the surgeon says, "Syphilis, tuberculosis." It is a well known fact that syphilitic bones heal pretty well, and very often we have fractures which occur without force, the so-called voluntary pathological fractures, which are also a sequence of syphilis.

I remember one of my first tests was on a case of a sarco-joint. The fellow came into the Department hobbling along and two doctors with him. The diagnosis was a cancer of the knee. He was examined by some of my associates. I looked at the case and I said, "Gentlemen, we may not see a case like this soon." We made a diagnosis and I put my foot into it, because when I said, "Sarco-joint," which is a late development of a neurosyphilis, they said, "How do we come to pay for that?" I said, "You will pay for it. He hasn't got a sarco-joint on the other knee where he wasn't hurt." That was a case of advanced syphilis. It takes years before a person can have a sarco-joint after its incipient infection.

I shall tell you something about tuberculosis. I may tell you, as I referred to statistics in the matter, that a good many people, more so than in syphilis, have tuberculosis without any knowledge of it. They may, in fact, have had an active neurosis in life. Any number of persons have a chill once in a while — a slight chill. The poor working woman or man does not think that is important enough to take to a doctor. Such a person meets with an injury, a blow to the chest, an over-exertion, undue exposure to the elements, and all of a sudden becomes rapidly emaciated and coughs. Then the doctor puts a stethoscope on the patient and says, "Ah, tuberculosis." Anybody can tell that, but the doctor will say, "You have had that a long time. That did not come from the injury."

It is the same as syphilis; it is the dormant condition of the bacteria which become active when you lower the vitality. It is the fight of the bacteria against the resisting power of the individual, so that if there is a part in the body which naturally or by acquirement has been lowered by disease, although there are no manifestations, the bacteria is activated.

This occurred to me in a discussion on tubercular pneumonia. A professor of a university, who was my opponent, said, "Dr. Lewy, are you aware that I experimented on bacteria?" I said, "No, sir." He said, "I have taken a set of rabbits and injected into them certain pneumococci, the bacteria of pneumonia. Some of my rabbits got the disease; some did not get the disease." I said, "I venture to say, Doctor, that in your experimentation those rabbits that got the disease you had in cellars where there was no light and air and you didn't give them enough food.' He said, "Yes, I artificially devitalized them." I said, "Well, what you did to the rabbit you did to my claimant by knocking him in the chest." That is just exactly it. He had to take the healthy rabbit which was immune. In consequence of its resisting power, he had to artificially lower its vitality and resistance, which the accident did for the workman.

I could continue, gentlemen, but it would be simply a repetition of the very many principles that you have heard me speak on. You have heard me talk of local infections with secondary systemic manifestations, and you have heard me speak of systemic infections like tuberculosis and syphilis which can be in a workman in the inactive state for many years. If he meets with an injury and such an injury is the cause either of exacerbating a previous condition or of reactivating something which has been dormant, he is considered a healthy man until the time of his injury and you must compensate him for the sequelae of his accident and even for ultimate death, if it occurs.

Just a few words about cancer and then you will get rid of me. The medical profession has worked for many, many years from the laboratory point of view, from the clinical point of view, from the pathological point of view, from the operative point of view. We do not know as yet the cause of cancer. I have had a controversy on the subject with the gentleman who has written more on sarcoma in this country than anybody. He is a very good friend of mine — Dr. Coley, and he said, "I am beginning to think and have been of the opinion for some time that cancer is of the infectious type, that is, it is due to a bacterium." I, for the world, cannot conceive a hypothesis of infection in cancer, and I said to him, "Tell me — surgeons have been infected at the operating table with every known infection — septemia, syphilis, tuberculosis, anthrax. Have you ever heard of a surgeon being infected with a cancer?" That is a mighty strong weapon that I have against the infection theory. Well, I cannot tell the cause of cancer either, so that makes it about even.

The cancers which come up most often, from an industrial point of view, are those which develop in parts of the body which the human being uses in his industrial vocation, the parts which he exposes to danger, the prominent parts, elbows, knees, hips.

Let us say that in this hall we are now a congress of eminent surgeons, and let us say that we would bring in here a thousand men and these men are to be examined. Let us suppose that each individual man would be examined by each surgeon, and when we have examined these thousand men, we would say there is no evidence by examination of the slightest indication of cancer of any part of the bodies of those men. What would you say if in six months one of the men, or two or ten, would come back and say, "I bumped my knee; look what I have got." We would look and find he has an osteosarcoma. It is an established fact at this date among all educated surgeons, (I mean by that surgeons who know pathology) that trauma is an activating cause for sarcoma. Why doesn't every fellow get sarcoma if he breaks his leg? Not every one gets infected with syphilis, not every one gets infected with tuberculosis.

Early in my career I did laboratory work for four years. Next to me sat a man from Peru, from Lima, and we both did the examination of tubercular bacilli. He used to sit and pick out the sputum with a fine platinum needle. I would take my hands and rub it all around together, wash my hands and eat my dinner. I am here and he died of tuberculosis. I have absolutely no cause to get tuberculosis because my inherent forces are against that disease.

It must be apparent to every human being without a medically educated mind that as we differ in anatomical appearance, in our very anatomical accessory parts, so must we differ in our resistance based upon the internal organs.

I predict that in ten years from now those who will study endothelial glands will know a good deal more than we know now. In referring to a cancer, the same assertion that I made of syphilis and tuberculosis holds good. If the individual can prove to you that he had an injury, however slight it may be, and even though he had not been disabled immediately, if within a reasonably short time at the place or within the vicinity of such place of injury a tumor develops, that is an absolutely traumatic sarcoma and is compensated.

With these few remarks, gentlemen, I think it is proper, after you have heard me and know about my opinion, to leave this Latin phrase with you: "Amicus Plato, sed magnus amicus veritas,"— Plato is my friend, but the truth is a still greater friend.

The great problem now is reconstruction and rehabilitation. One of the greatest works which has been written was by Monahan, the English surgeon, who in his monograph said that the profession was challenged by these terrible virulent infections. I believe there is a second challenge to the medical profession. Let us see to what extent we can reconstruct permanent deformities.

GENERAL DISCUSSION

Commissioner Sayer: We will be very glad to have any questions as to either Dr. Shoudy's or Dr. Lewy's address.

Mr. James C. Cochrane, American Railway Express Company, New York City: We have heard with much interest from Dr. Shoudy and Dr. Lewy. In many matters I have disagreed with Dr. Lewy in the past three years, in compensating the pre-existing condition of syphilis particularly.

We have heard from these gentlemen from a medical standpoint. Let us dwell on the subject from the point of view of cooperation, organization and concentration. In cooperation we are confronted with the Bloomfield case, in which a girl had stuck her finger with a tack. Her employer told her to put some peroxide on it and dismissed her. There was lack of cooperation between the employer and the employee. The Bloomfield decision brought up the matter of notice, to which considerable more attention should be given than has been given in the past.

We have tried under one eminent surgeon to establish seventy-two physicians in greater New York to whom each and every employee must apply, that is, he applies to the nearest one of those seventy-two physicians to him. In that way we get a check on our men. When an infection develops, the doctor reports it to the chief surgeon, who reports it to our office.

It is a good deal easier, of course, to criticize and suggest than to put into effect a remedy. Nevertheless, that is what we have done in this case.

Mr. H. C. Meyer, McQuade Stevedoring Co., New York City: I should like to inquire of Dr. Lewy what effect the immediate application of iodine has upon an injury such as a scratch upon a man's hand. We have a first aid department and apply such as that to an injury immediately upon the happening of the accident. Occasionally, we find a man who makes application for compensation two months later, claiming disability up to that time. What I would like to know is whether or not Dr. Lewy, in diagnosing a case, takes into account the question as to whether or not the claimant is exaggerating with reference to his disability, and if he does report to the Commission, whether or not it is the duty of the Commission to follow his opinion and make the award therewith.

The reason I bring that question up is because in introducing Dr. Lewy the Chairman referred to him as the gentleman who was advising the Industrial Commission,

Commissioner Mitchell, New York Industrial Commission: Dr. Lewy, of course, is not an authority on what the Commission will do. Dr. Lewy advises the Commission, but the Commission decides what course it shall pursue.

MR. MEYER: Then why is Dr. Lewy to express his opinion in any of these cases? Why should he express his opinion to the Commission with reference to a claimant's disability unless his opinion is to be absolutely acted upon in each and every case. I should like to have Dr. Lewy answer that question by expressing his opinion as to whether or not the Commission should follow his opinion as to the question in hand. I think the answer would be of benefit to us all because I have in mind a particular case in which Dr. Lewy did express his opinion, and his opinion was similar to my physician's opinion; they agreed upon it. Dr. Lewy stated that this man's disability should not have exceeded four weeks and an award was made of six weeks' compensation. It seems to me that a decision of that kind is absolutely unfair. It is not in accordance with justice and it is not in accordance with the opinion of the examining physician on behalf of the Commission.

COMMISSIONER SAYER: I presume that is a question that Dr. Lewy can't very well answer. The Commission is supposed to be endowed with some intelligence. It is supposed to exercise its functions under the law as it sees its duty, and the orderly way to review such a matter as that, if the Commission was in error in awarding more compensation to the injured workman than the company could well afford to pay, was to appeal it to the courts. I don't believe it calls for any answer from Dr. Lewy.

MR. D. C. GOLDEN, American Life Society, New York City: The previous speaker asked Dr. Lewy a question about a slight scratch being treated with iodine, which led into a discussion of something entirely foreign to the original question. I think many of us would like to hear the answer to his question in reference to the treatment of a slight injury.

DR. LEWY: It must be good when you consider that in former years those men who were preparing a patient for the operating table — the assistants or surgeons — to undergo an opening of the abdomen, the night before he was to have the operation shaved him and washed and scrubbed him, put on a dressing and when they got him on the table they put on soap and water and six more gallons of water and soap, and they put on alcohol and ether, while now all they do is to swab iodine over the patient and the results are excellent. But that is a different thing than minute injuries. In the abdomen the incisions are large. Iodine application in a superficial abrasion, which means the involvement of the superficial epidermis, the upper layer of the skin, or maybe the derma itself, without a punctured wound is a very excellent application as a preventive for infection, but where the wound is a stab wound, a deep wound, the iodine will only act as a germicide or as an antiseptic superficially.

MR. GOLDEN: Dr. Lewy, has the experience in war surgery contributed anything to industrial accident surgery?

DR. LEWY: That is a very vast subject. Gentlemen, war surgery is not industrial surgery. The conditions there we rarely see here. We could not even imitate them. The bacteria are different. It makes a mighty big difference whether a bullet hits at eight hundred yards or six hundred yards — such a remarkable difference in effect that in one instance it is a serious injury and jeopardy of life and in the other it is only a surgical injury. Of course, you cannot compare war surgery with industrial surgery nor the causes of accidents in war surgery and industrial surgery.

The only thing of advantage to the surgeons who went over there and saw the conditions and who are fortunate enough to come back is that they have been made good surgeons and bold surgeons, because one of the greatest qualifications of a surgeon is courage and boldness. Many a man is an able surgeon with his mouth; he can lecture and give out the greatest pathological findings and be a marvelous teacher, but at the table he is ————.

Mr. William Rander, General Organizer, Brotherhood of Printers, Rochester: Dr. Shoudy, in his remarks, pointed out the many disastrous effects on working men owing to their neglect. In other words, he said, "Taking a chance." May I suggest another reason? There are many men going into factories, working for a wage that is just enough to keep the family together. Many times that man goes into work when he knows that he should be in bed, but his love for his family and his knowledge that he is not able financially to remain away from his work forces him to work on. That is one of the reasons, Mr. Chairman, that there are so many men taking chances — because their circumstances compel them to do it. If there were some way of taking care of the wage earner so that he would know he could go and get his medical care, or go and get his operation when he needed it without paying a life's savings for it, we would find a better class of workers, healthier workers, and we would do what we have said so many times here during the war we must do — conserve our man-power.

Mr. Cochrane: In answer to the speaker who mentioned the return of the man to work before he was physically able — that is obviated by Mr. George C. Taylor, President of the American Railway Express Company, in paying the man his full wages for one month's disability, and after that placing him upon compensation, and after that carrying out to the utmost the entire medical program suggested by our doctors.

Commissioner Sayer: You mean that the man is paid full wages if he is laid up sick?

Mr. Cochrane: No, if he is injured.

Mr. J. P. Holland, President, New York State Federation of Labor, New York City: I don't think we ought to let Dr. Lewy's remarks go by unnoticed. I want to say this for the working people of this State: If there were more men of Dr. Lewy's type in this State, there would be less maimed and injured workmen walking around over the streets on crutches. The only trouble with some of the doctors is that they don't like the broad statements made by Dr. Lewy.

Commissioner Sayer: I might say to the Congress here that if the New York State Industrial Commission has acquired a reputation for liberality, (and I know we are sometimes accused of greater liberality that we should show) we have Dr. Lewy to thank for it.

Mr. Robert Northrup, Factory Inspector, New York Industrial Commission: Many of the large manufacturing plants are developing splendid hospitals.

There is a question as to the attendants at those hospitals. I am going to cite an instance where a man had a slight wound on his finger; he had gotten it in a machine shop. He immediately went to a hospital room. The hospital room was 100 per cent in equipment and sanitation. The man's finger was treated and bandaged and he went home. He told the attendant at the time that his bandage was too tight and when he got home, the attendant having refused to remove it, telling him it was all right, the bandage was so tight that it pained him and the blood receded. He took the bandage off and gave it home treatment. Infection set in. He lost his arm as a result. His left arm became paralyzed. My point is this: In the establishment of hospital rooms in the factories, which will take place more and more, there must be something to govern the selection of attendants for those rooms. I have talked with many hospital attendants and I have asked them, "Are you a physician?" and in the majority of cases the attendant is taken from the organization, from the company or corporation, as the right man to place there. He does a little home study on the subject, but he is ignorant of the actual operation of first aid.

I hold that the time is present, and perhaps the time is far past, when examinations should be made and licenses given only to those who are capable.

Dr. Shoudy: I didn't intend to come back at you, but that hits home at a very good point. If you want a good physician, if you want a good shoemaker, if you want a good foreman, if you want a good man for any place in your shop, you must pay him. If you want good doctors or good nurses or good attendants, you must pay them, and the majority of you don't do it. You get just what you pay for. There are bum doctors just as there are bum men in other lines, and a lot of fellows looking for a job will drop around and if you offer them $100.00 a month to do work of that character and they accept, you will get $100.00 a month in return. If you want to have the thing go right, pay them sufficient to go in there and handle things properly and not have to do something on the outside for a living. Pay them to develop the whole thing and you will will solve your problem.

Mr. Northrup: My point is that manufacturers will not pay that price until the State causes the applicants to be licensed.

Dr. Shoudy: The applicants are licensed.

Dr. Rosalie Bell, Medical Inspector, New York Industrial Commission: Would it be in order to suggest to this Congress that they ask for information as to just where such treatment was given to a superficial wound? There has been a picture shown of a little log cabin first aid room with an attendant who was evidently not a physician. An injured workman came in, the attendant poured a little iodine on the wound, and the workman went away. That picture was shown to something like 150,000 workmen, and that would spread the idea that such care would be sufficient.

Mr. H. G. Meacham, Goulds Manufacturing Co., Seneca Falls: Dr. Lewy has wisely said that the human mind acts only after an event occurs. Let's go back before the event of infection. Both Dr. Shoudy and Dr. Lewy say that the degree of infection depends upon the vitality of the man who receives the superficial wound. How can you expect to avoid infection in a workman over whom you perhaps have supervision for eight or ten hours a day, but for the remaining hours you have absolutely no control over his actions in any way, shape or manner, actions that tend to the lowering of that vitality?

Commissioner Sayer: This is an interesting discussion and I suppose it might run on almost indefinitely, but I am afraid we will have to call an end to the discussion of these infections. We have another paper on the program, and if we are to hear that (and it is a very valuable and interesting contribution), we had better proceed with our program.

Mr. S. S. Landon, Todd Protectograph Company, Rochester: I just want to make the suggestion here that it seems to me we could have a sort of clearing house for these cases and let them go to physicians such as Dr. Lewy and find out what the results are. If we have a lot of bum physicians attending the majority of these cases, then let's get a place where we can send them and have them examined properly.

Commissioner Sayer: I have pleasure in introducing Mr. Albert H. Mowbray, Chief Actuary, State Insurance Fund, who will speak on "Infections — Their Cost in Time and Cash." Mr. Mowbray.

INFECTIONS — THEIR COST IN TIME AND CASH

By Albert H. Mowbray, Actuary State Insurance Fund

Mr. Chairman, Ladies and Gentlemen, Members of the Congress: When the Chairman of your Program Committee asked me to talk to you on "Infections — Their Cost in Time and Cash," I knew that I knew nothing about infections and less about their cost, but it is the province of the actuary to study costs and so I took on the contract, and it was not until I actually began work that I realized that the statistical data with which to work was almost non-existent, so if what I have to say to you sounds almost like scientific guessing, or if it appears that I have gone too far afield in my material, please blame it on the lack of material.

Dr. L. W. Hatch, Chief Statistician of the Industrial Commission, has courteously furnished me with a special study made by his department of infected injuries reported to the Industrial Commission during the period July 1, 1914, to June 30, 1915. During this period there were reported to the Commission a total of 39,622 compensatable injury cases. Of these, slightly more than one-eighth — to be exact, 5,166 cases — became infected. Of these 5,166 cases, death resulted in 65 instances. In 329 there was a total loss of some member — 39 of the eye, 9 of a hand, 3 of a leg, 2 of a foot, 250 of fingers, 22 of toes, and 4 of other members. In 113 cases there was permanent impairment of a member — of the eye 11, arm 6, hand 27, leg 8, foot 7, fingers 52, toes 1, other members 1. Four thousand six hundred ninety-five cases resulted in temporary disability with an aggregate loss of 31,928 weeks, or an average of 6.85 weeks per case. Deducting the waiting time, 22,610 weeks' compensation was required with an average compensation duration of 4.85 weeks per case. This shows that infected cases are costly in both time and cash, but, curiously enough, the average lost time per case was almost the same as the average lost time on all cases reported.

A superficial examination of these figures might lead to either one or two erroneous conclusions; one, that if infections could be absolutely prevented, approximately one-eighth of the loss cost imposed by industrial accidents would be saved; and the other, that, since the average lost time in infected cases is the same as the average lost time for all cases, infections of themselves have not produced any material additional cost.

The fallacy in the first conclusion arises from considering infection as a primary independent cause. Infection occurs after some previous injury and aggravates the effect of that injury; therefore, the prevention of infections would not have saved the entire cost of these cases. The fallacy in the second conclusion was not so obvious on the surface, but arises from the fact that, generally speaking, the injuries which have become infected were really minor injuries which should not, but for the infection, have produced anything like the serious costs shown by this study.

Let me illustrate: On June 5, 1918, while hanging paper, a workman cut the middle finger of his left hand with a rusty nail. He did not have it promptly and carefully attended to and it became infected. First treatment by a doctor was on June 19 and consisted of incision, drainage and dressings. The claimant was examined at the State Fund Medical Department on July 13. at which time the terminal joint of the finger was found to be somewhat stiffened. After a course of treatment, infection was controlled and the stiffening reduced to a minimum. Fifteen weeks' compensation at $11.54 a week was the cost to the insurance carrier of this man's neglect of his injury. His own time loss was worth another $100. Medical bills amounted to $41.00. This man need have lost less than a weeks's time had his finger been properly dressed at once. Perhaps he would have lost no time at all.

An employee in a machine shop dropped a small casting, causing severe bruises and lacerations to one foot, though no bones were broken or the foot structurally damaged. We might have expected a maximum of ten days away from work, a loss to the man of, say, eight working days at $5.00 a day, perhaps $40, and a doctor's bill for dressings of $10.00 for his employer or his insurer. But he did not have it properly cared for at the outset and it became infected. The doctor's bill alone was $149, made up of $10.00 for two operations, ($5.00 each) opening it up, forty house visits at $3.00 each and nineteen office visits at $1.00 each. He lost ten weeks at about $30.00 per week — $300.00. He received compensation for eight and one-half weeks under the Massachusetts law at $14.00 or $119. His net loss was about $181. The insurance company's was $268. His employer's is not so easily determined, but it certainly cost something to either fill his place or run shorthanded for ten weeks.

On July 27, 1914, while laying a sidewalk, a carpenter was injured in the foot by a nail sticking out of a plank on the runway. On August 1, 1914, he reported at the office to receive his pay. His foot was then in a slipper. He promised to return to work August 3, 1914. When he did not report on that day, it was found on inquiry that he had been sent to a hospital, where he died on August 5, 1914, of tetanus. An award for compensation of $15.00 bi-weekly was made to his father and mother. The value of this claim as of the date of death was $5,441. Funeral expenses were $100. But for the infection, the cost would have been one week's lost time.

In order to get a true measure of the economic loss due to infection, we should compare the loss in infected cases with the loss in uninfected cases where all other conditions except the intervention of infection were precisely the same. Of course, this is the unattainable ideal. This sort of condition might be produced in a physical laboratory in dealing with inanimate forces, but, clearly, it is not possible in dealing with a subject matter such as we have before us. It is, however, possible to approximate with more or less closeness to these conditions and I have made one or two such attempts.

When first asked to prepare this paper, I took the matter up with Mr. P. A. Broderick, Assistant Secretary of the Industrial Accident Board of Massachusetts, and he very courteously examined 100 non-fatal tabulatable injuries resulting in temporary disability only, occurring between July 1, 1916, and June 30, 1917, where the injury was trivial in its nature (minor cuts, burns, etc.) and where infection had set in, these 100 cases being taken at random. The results of this investigation are in Table I, which follows. To compare with this, he also examined 100 random cases of non-fatal temporarily disabling injuries due to slivers, sharp edges, corners, etc., in the building trades where infection had not been present. The result of this investigation is shown in Table II. It will be noted that the time loss and monetary loss where infection was present was about three times that where infection was not present.

TABLE I

DURATION OF TOTAL DISABILITY AND WAGE LOSS. INFECTIONS DUE TO TRIVIAL CUTS, BURNS, ETC., IN 100 NON-FATAL TABULATABLE INJURIES. RANDOM SAMPLES FROM CASES REPORTED TO MASSACHUSETTS INDUSTRIAL ACCIDENT BOARD JULY 1, 1916, TO JUNE 30, 1917.

DURATION (DAYS)	Number of cases	Wage loss	DURATION (DAYS)	Number of cases	Wage loss
2	1	$5	30	1	$77
3	1	12	31	2	161
4	3	30	32	1	101
5	2	35	34	1	107
6	2	36	35	1	68
7	6	113	37	2	191
8	4	72	38	2	257
9	3	70	39	2	117
10	3	85	42	5	568
11	1	31	43	2	239
12	1	19	44	1	75
13	1	51	49	1	105
14	5	237	56	2	301
15	1	32	59	1	164
16	2	58	60	3	554
18	2	105	63	1	198
19	2	109	67	1	287
20	2	149	69	1	104
21	7	448	76	1	263
22	2	152	77	1	166
23	2	121	117	1	353
24	1	51	122	1	366
25	2	115	136	1	513
26	2	95	28 (weeks)	1	504
28	4	314			
29	2	168	Total	100	$8,552
			Total days lost, 3,054.		

TABLE II

DURATION OF TOTAL DISABILITY AND WAGE LOSS. INJURIES DUE TO SLIVERS, SHARP EDGES, CORNERS, ETC. 100 NON-FATAL TABULATABLE INJURIES. RANDOM SAMPLES FROM CASES REPORTED TO MASSACHUSETTS INDUSTRIAL ACCIDENT BOARD, JULY 1, 1916, TO JUNE 30, 1917.

DURATION (DAYS)	Number of cases	Wage loss	DURATION (DAYS)	Number of cases	Wages loss
2	8	$52	16	2	$62
3	12	101	17	1	29
4	10	117	18	1	54
5	8	100	19	1	41
6	12	202	20	2	151
7	11	230	28	2	106
8	3	63	29	1	75
9	3	58	32	1	151
10	5	110	34	1	117
11	2	53	39	1	67
12	4	112	40	1	86
13	3	96	73	1	296
14	2	67	133	1	177
15	1	51			
			Total	100	$2,824
			Total days lost, 1,096.		

In order to make a little more apparent the slower rate of recovery in infected cases, I have rearranged the material shown in these tables, grouping it by weeks, as shown in Table III following:

TABLE III

DURATION OF TOTAL DISABILITY IN 100 NON-FATAL CASES IN MASSACHUSETTS.

WEEK	INFECTIONS DUE TO TRIVIAL CUTS, BURNS, ETC.		INJURIES (NOT INFECTED) DUE TO SLIVERS, SHARP EDGES, CORNERS	
	Recovered during week	Still disabled at end of week	Recovered during week	Still disabled at end of week
1st	15	85	61	39
2d	18	67	22	17
3d	16	51	8	9
4th	13	38	2	7
5th	8	30	3	4
6th	11	19	2	2
7th	4	15	....	2
8th	2	13	....	2
9th	5	8	....	2
10th	2	6	....	2
11th	2	4	1	1
12th	....	4	....	1
13th	....	4	....	1
14th	....	4	....	1
15th	....	4	....	1
16th	....	4	....	1
17th	1	3	....	1
18th	1	2	....	1
19th	....	2	1	....
20th	1	1	....	....
28th	1	....	....	....
Total	100	....	100	....

I think these data are indicative, but they hardly seem to me conclusive. In the first place, we are dealing only with two sets of 100 random samples, and in the second place, we cannot be sure that the fundamental injuries were of practically equal seriousness. The class of uninfected injury cases examined were, however, the nearest classification then available to what Mr. Broderick felt were the underlying injuries in the infected cases. There is also a weakness in that this tabulation takes no account of the possibly fatal results of the infection, and we know that the contingency of fatal results is large when infection once sets in, nor does it bring in permanent disability cases. For example, in the data furnished by Dr. Hatch and quoted in the first part of this paper, fatal results occurred in one per cent of the cases.

I have not, therefore, been content to accept these indications as conclusive, but have sought further data in the effort to substantiate them or prove them misleading, if such should be the case. In the reports of the Industrial Insurance Department of the State of Washington I have found a number of interesting tables, which seem to furnish the basis of such comparison as was absolutely necessary to give a positive answer to our question. These tables analyze the cases compensated by that Department by causes, according to ing tables, which seem to furnish the basis of such comparison as was absolutely necessary to give a positive answer to your question. These tables the part of the body affected, the cause classifications used being, as follows, bruises, cuts, punctures, dislocations, sprains, amputations, fractures, scalds and burns, infections, and unclassified. The cases attributed to infection do not appear in the other tables but there is an additional table dealing with infected cases, giving the number of cases originating from each of the other causes according to the part of the body affected.

We are thus able to find from their first tabulations the average cost in days of lost time of a given type of injury to a particular member of the body where no infection occurs. Then, knowing the number of such cases which afterward became infected, we are able to determine with a good degree of approximation what the loss of time would have been had the infection been averted. Taking this in the aggregate and comparing it with the actual lost time in these cases, we get an approximate measure of the effect of the intervening infection. As the Washington report also analyzed their fatalities, it was possible to bring in the contingency of fatal results. I have made this investigation upon the data furnished in the fifth annual report, covering cases closed by the Department during the period from October 1, 1915, to September 30, 1916, and in the sixth annual report, covering cases closed between October 1, 1916, and September 30, 1917. The mere arithmetic work need hardly be set down here. As appears from Table IV, following, the results of the two sets are remarkably close (except for the disturbing effect of fatal consequences, which occurred in eleven cases in one year against only five in the other), showing a duration of disability in infected cases averaging approximately two and one-half times the duration to be expected from a similarly composed group of uninfected cases as shown by their experience.

TABLE IV

COMPARISON OF ACTUAL AND EXPECTED TIME LOSS IN INFECTED ACCIDENTAL INJURIES IN THE STATE OF WASHINGTON

	DATA FROM FIFTH REPORT — CASES CLOSED, OCTOBER 1, 1915, TO SEPTEMBER 30, 1916			DATA FROM SIXTH REPORT — CASES CLOSED, OCTOBER 1, 1916, TO SEPTEMBER 30, 1917		
	Actual days lost time	Expected for un-infected cases	Ratio actual to expected	Actual days lost time	Expected for un-infected cases	Ratio actual to expected
			Per cent			*Per cent*
All non-fatal cases......	38,566	20,801	185.4	37,431	26,020	143.1
Cases resulting in death..	15,000	*232	6,465.5	33,000	*546	6,044.0
Total cases............	53,566	21,033	254.7	70,431	26,566	264.4

* Based on average duration of non-fatal cases, i. e., it is assumed that but for infection death would not have occurred, the report indicating that the infection was the true cause of death.

There may be some question as to the precise accuracy for application elsewhere of these figures based upon the Washington report, for results must vary with different administrative interpretations, such as those relating to cases of permanent partial disability. But we are not concerned with fixing an exact price for the infection hazard. A rather rough approximation will serve every purpose. The general indication, it seems to me, is fairly clear that the intervention of infection adds about one and one-half times to the average cost of injuries. This is a bit more conservative than the indications of the samples taken from Massachusetts. Our result might be put in another way by saying that prevention of infection would save about 60 per cent of the cost of the infected cases. Examinations of the various reports of the different industrial commissions shows that the cost of infection cases runs from about 5 to 10 per cent of the total cost of all cases. Thus, the saving by prevention of infection is approximately from 3 to 6 per cent of the total cost of industrial accidents.

This saving of itself would be a very high return upon the cost of the precautions necessary to prevent infection, for, generally speaking, prompt disinfection, proper first aid and dressing, and thorough cleanliness are sufficient. But it seems to me that this is rather a cold, calculating way of considering the matter, and its value lies mainly in showing that prevention of infection really does pay big returns. When considering the question whether or not the necessary effort should be made to prevent infections, it seems to me we should disregard this point of view and think rather of the disastrous possibilities the little bugs always bring with them when they gain an entrance in any individual case, and rather resolve that, cost or no cost, "Here they shall not pass."

COMMISSIONER SAYER: If there is no discussion of this paper, this session will stand adjourned.

WEDNESDAY AFTERNOON, DECEMBER 4

PRESIDING OFFICER: JOHN MITCHELL, NEW YORK INDUSTRIAL COMMISSION

COMMISSIONER MITCHELL: Ladies and Gentlemen: One year ago, when the Safety Congress met in this city, our nation had entered and was participating in the great world war. At that time wherever men met, wherever they were, whatever the purpose of their meeting, one thought, one purpose, one determination was uppermost in their minds — the winning of the war. The destruction of autocracy — of autocratic forms of government, the preservation of liberty, the establishment of democracy — these were the thoughts and these were the purposes that animated the minds and the souls of men. Today, happily, the great world war has come to an end and the high ideals which caused people of our blessed country to participate in that war have been achieved. Liberty has been preserved; autocratic forms of government have fallen and the world has indeed been made safe for democracy; and now our thoughts turn from war to pursuits of peace.

We are now confronted with new problems, the solution of which will require the best thought and the best energy of all liberty loving patriotic men.

This afternoon our program calls for the discussion of one of these great problems — "Rehabilitation of Maimed Workmen." As you know, of course, our Government has made generous provision for the rehabilitation or re-education of our men who have been wounded and crippled during the war, and there is now pending before Congress a bill providing funds for the re-education of men who have been crippled in our industrial processes. While, of course, the merits of this particular bill is not a matter to be discussed this afternoon, yet the subject matter of the rehabilitation, or industrial re-education, of industrial cripples is to form the theme of the afternoon discussion.

I regret that some changes are to be made in the program, not because we are lacking talent, rather we are fortunate in having men with us to discuss the subject here who are by experience and training capable of discussing it as ably as those who have by unavoidable circumstances been prevented from being here.

Under date of December 2, the following letter was received at the offices of the Industrial Safety Congress from Major Harry Mock of the U. S. Surgeon General's office, who was on the program to speak this afternoon:

> I regret very much my inability to be present at your meeting and take part in your program.
>
> There is one thought, however, which I wish to give you. I hope your organization will take some action to influence Federal legislation to meet the whole problem instead of some portion of it. Our Government has appropriated millions of dollars for the reconstruction and rehabilitation of the disabled soldiers. Since the war closed, it is estimated not more than 50,000 of these will need physical reconstruction and certainly not more than 10,000 will require vocational training. Compare

these plans of the Government with the lack of plans and the meager appropriations allowed for the reclamation of the disabled employees, the soldiers of our great industrial army of whom, on the least estimate, there are 800,000 disabled by disease and accident in industry each year, who need physical reconstruction, and at least 200,000 of these need training in new and better occupations.

If the casualty lists from industry could be printed every day in our newspapers, the people of this country would be appalled at the size. In one year from accidents alone it is over eight times as large as the entire casualties among our troops on the battlefield of Europe. We have no record to show the number that were killed or disabled as a result of occupational diseases and diseases partially traceable to working conditions, but these undoubtedly are even more shocking.

Each year a quarter of a million men, on account of disease or accident, are prematurely thrown on the scrap heap because their handicaps prevent them from continuing at their old occupations.

This casting of valuable workers heedlessly on the scrap heap must cease. With the cessation of immigration and the increased demand on our industrial resources, America must preserve her man-power if she intends to maintain her economic supremacy. Industry must blaze the trail in this conservation and reclamation of human life.

The prevention of accidents, industrial hygiene and sanitation, adequate surgical and medical care for the sick and injured employees, adequate compensation during periods of disability and better living conditions and working conditions for all employees, are the proven methods which will stop this human wastage.

In these reconstruction days following the terrific destruction of this war may our people step forth with a broadened vision and greater capacity for service and strive for this ideal — human conservation and reclamation of all disabled.

I am also requested to announce that Dr. C. A. Prosser of the Federal Board for Vocational Education has been unable to attend and address the meeting this afternoon, but we are fortunate in having in his stead Mr. J. Albert Robinson, Special Agent for Safety and Hygiene of the Federal Board for Vocational Education, whom I now have the pleasure of presenting.

TEACHING SAFETY AND HYGIENE IN VOCATIONAL SCHOOLS

BY J. ALBERT ROBINSON, SPECIAL AGENT FOR SAFETY AND HYGIENE, FEDERAL BOARD FOR VOCATIONAL EDUCATION

Mr. Chairman, Ladies and Gentlemen: It is with the greatest regret that Dr. Prosser, Director of the Federal Board for Vocational Education, cannot be with this inspiring convention this afternoon. He has been ill, has recently returned to his desk and finds things of such importance that he could not undertake this journey. He has, therefore, delegated a most unworthy disciple to come up here as a substitute. Dr. Prosser wishes he might have been here, and I feel entirely inadequate for the occasion.

In casting my eyes over the program and seeing the other gentlemen scheduled to speak on this great subject this afternoon, the thought occurs to me that a conversation overheard of the three oysters is not inappropriate to the occasion. One oyster wanted to know from the other two where he was. He was told that he was in the stew. He said, "I know, but where are we?"

"Why, you are in the stew at the church supper." Then he said. "Then why need there be the third one?" I feel that I, perhaps, need not have been the third one.

I think, perhaps, that I should state to you what the Federal Board for Vocational Education is. A year or more ago Congress passed a bill known as the Smith-Hughes Act which empowered a central body to be known as the Federal Board for Vocational Education to have jurisdiction over vocational education throughout the country. Under the terms of this bill, any state may co-operate by accepting that bill either through the act of its governor or its legislature and. by so accepting the bill, it becomes possible to receive from the Federal Government aid to the extent of $1.00 for every dollar the state spends in the furtherance and advance of vocational education. It was the intent of this bill to utilize all such existing machinery as could be found. The trade and vocational schools were already equipped to carry on the work. The Board was also given power to carry on investigations in order to see what particular vocations might not be suitably cared for by existing educational machinery.

It is extremely gratifying to know that every state in the Union has accepted this Act and is carrying out a scheme of vocational education and already receiving various sums of money from the Federal Government to be combined with a like sum from each state, according to population.

The program states that Dr. Prosser was to speak on "Teaching Safety and Hygiene in Vocational Schools." I will, therefore, just touch upon that subject. There was created the office of Special Agent for Safety and Hygiene, which I have the pleasure to occupy. It was created for several purposes: First, there would be a central source of information to which directors of vocational schools could turn to seek advice as to fire prevention or fire protection, safety protection, improvement in conditions of hygiene at their respective schools. Furthermore, it is the intention to prepare outlines of instruction of a general nature covering features of fire prevention, safety work and hygiene to present to the pupils of these schools. Then, again, it is the intention of the Board to issue specific bulletins on the hazards of various industries, to be presented in connection with the various courses of instruction in various types of vocational schools. This work is barely under way and presumably the first safety bulletin to be issued will be of a general nature. It may be that the Board will find an opportunity, or find a demand, for something in the way of a simple text book for the use of the pupils themselves, both in pursuing courses along these lines in the schools and as guides of conduct for their after life, both in their civic and social life and in their factory life.

It would seem as if the vocational schools, through the help of the Federal Board, have a unique opportunity to inculcate into the minds of young people at the very time when they are susceptible to moulding in the right direction, fundamental principles of safety and hygiene, because we are now entering into a great era. The war has now closed. The industrial reconstruction period is upon us and it is from these vocational schools that the workers of the future are to be produced.

We have heard much in the past of conservation — conservation of wealth, conservation of property. We have realized by reason of this war the tremendous value of man-power and the great need for conservation of man-power is being brought before us. Certainly, needless accidents and loss of time from sickness is one of the greatest national wastes that exists in this country. I need not discuss statistics before this audience,— the millions of dollars lost in property by fire, the sorrow and suffering created by accident and disease. Those figures are too well known to you.

Perhaps, since the afternoon is more directly related to rehabilitation work, it would be of interest to discuss for a few moments the work of the Federal Board for Vocational Education in the rehabilitation of the crippled soldier.

On April 6, 1918, Senator Hoke Smith and Representative Sears introduced the bill known as the Smith-Sears Act, providing for the vocational rehabilitation and return to civil employment of disabled persons discharged from the military or naval forces of the United States. The bill passed the Senate unanimously on May 25, went to the House, and on June 20 unanimously passed that body. The act delegates to the Federal Board for Vocational Education the duty of re-educating the disabled man in some useful employment which he will be deemed capable of following with profit. While the men are taking the special courses, compensation will be allowed them and family allowances will be paid their families precisely as if the men were still in active service. At the conclusion of the courses, agencies will be ready for assistance in placing the re-educated men in civil life.

The Federal Board is now engaged in the task of making the necessary arrangements for the work which means so much to these men who have suffered impairment of their earning capacity. The re-education and subsequent placement in civil life will in no wise affect the compensation the men are to receive on account of disabilities from the War Risk Insurance Bureau. In fact, the compensation which they will receive to sustain them while they are pursuing their various courses will be related to and based upon that to which they are entitled from the War Risk Insurance Bureau. The Surgeon General's office is endeavoring to reconstruct the crippled and broken man in the hospitals. This munificent act was passed to take care of that man when he comes out of the hospital, to see that he has a show in life, to see that he is not cast, like our present industrial cripples, upon the human scrap heap to be left there without future hope or means of carrying on their family life.

It is the intention (in fact the machinery has been created) to do more than place this man and give him an opportunity to be re-educated in a new line of work for which his crippled condition will be best fitted, but into which line he may not have entered except for his re-education. It is their intention to follow the careers of these re-educated soldiers, to be the helping-hand in a return to civil and industrial life, to encourage them to continue their studies, to see that they are successfully placed in industry or business thereafter.

There have been established and created fourteen district vocational offices throughout the country in connection with which an organization has been created to do this work. There have been placed in each of these offices men who will investigate local conditions, who will keep in touch with the agencies of vocational education in their districts and who will follow up the social life of the men whom they place and see that they continue their studies and are successful in finding occupations thereafter.

It seemed particularly fitting that the Federal Board should encourage all vocational schools to think more than perhaps they had ever done before of such things as fire hazards, accident prevention, the removal of occupational diseases, because we believe — we know that these boys have seen all the horrors that they care to see, therefore, it is fitting that we should do all in our power to remove the industrial horrors that have been such a disgrace to our American life.

With the coming of peace every patriotic citizen who has been thrilled with the achievements of our American soldiers "over there" wonders how this great country with all of its resources can best repay the debt which it owes to those who have borne the brunt of battle. This debt is one common to all citizenship and one which all of us must help to pay in one way or another. The Federal Board has been charged with the task of re-educating and retraining all disabled soldiers and sailors to take their places in the world as independent, self-supporting citizens. You, the employers of America, are charged with the duty of co-operation. It is desirous to have co-operation, it is co-operation that the Federal Board wants.

It is the intention to offer a series of so-called opportunity monographs to the returning men. The monographs will be both inspirational and practical, describing some particular vocation or business opportunity, telling what it is, describing the inherent qualifications a man should have to be successful in that particular line of work, showing what forms of disability the man might possess and still feel that he would be successful in that particular line of work, and then pointing out where he may receive education along that particular line.

In preparing these monographs the Board must draw upon the brains of the men in these various industries who know more of their several opportunities and requirements than we in our small office in Washington can hope to know. For instance, I have personally been delegated to prepare one of the numerous monographs, showing the opportunities in the fire insurance business and fire protection engineering. That same monograph will include casualty insurance and safety engineering. I do not expect to compile the monograph, but I have drawn upon all possible available sources of information to prepare it and it is such co-operation in all lines that the Board seeks.

I do not know that there is anything further of interest that I can say except that the Federal Board for Vocational Education has established valuable machinery for rehabilitating cripples, for the present devoted to the rehabilitation of the crippled soldiers, and we hope that we can fill a great demand and do a great good by this means.

I have a few bulletins which bring out many facts and details in connection with the practical operation of this Smith–Sears Act, and later, if the matter is of interest and is under discussion, I will be pleased to answer any specific questions that may arise.

I thank you for your attention.

COMMISSIONER MITCHELL: The next speaker will be Mr. Lewis A. Wilson of the New York State Department of Education.

REHABILITATION OF INDUSTRIAL CRIPPLES.

BY LEWIS A. WILSON, DIRECTOR, AGRICULTURAL AND VOCATIONAL EDUCATION, NEW YORK STATE DEPARTMENT OF EDUCATION

Mr. Chairman, Ladies and Gentlemen: I came here this afternoon not to give a speech but to discuss very briefly Dr. Prosser's paper. I think the war has taught us many lessons. Many individuals have realized for years the necessity for doing certain types and certain phases of work. There have been people in this country who have realized the problem of illiteracy in the United States, but the war has brought to us the facts that are going to convince the legislatures of this country that we must set out to do a definite job in educating the rank and file of the people of this country. Very few people in this country appreciate the fact that eight per cent of the men who applied for admission to the United States army and who were drafted could not read or write. Very few people appreciate the fact that twenty-five to thirty per cent of the men — even thirty-five per cent of the men — taken into the United States Army or who appeared for physical examination were physically unfit for military service due to causes that could be easily remedied. In a like manner the problem of rehabilitation has been brought forcibly to the attention of the public. The Federal Government appropriates, or has appropriated, a large sum of money for the rehabilitation of the cripples of the war, and we know to-day that the problem of the rehabilitation of the cripples of industry is much more pressing and much more urgent than the problem of the retraining of the cripples of the war. Fundamentally it is a problem of education. I think we can safely say that the problem is twofold — first, the education of the rank and file of the children who are coming up through the public schools; second, the problem of adult education. The first responsibility rests almost entirely with the public school officials. They must plan their courses in such a way that each child will receive the benefits of the best type of education that it is possible to provide. The second problem is a problem that vitally concerns the men who are represented at this meeting to-day — the problem of adult education.

The rank and file of workers in this country are anxious for educational work. Do you realize that during the past fifteen years 1,300,000 workmen of this country have taken correspondence courses? Do you realize that those men have paid on an average of $70 or $80 per course? Do you realize that less than thirteen per cent of those men have completed the courses? In other words, during the past fifteen years the American working man has invested over $100,000,000 in correspondence schools and correspondence school education.

We are just beginning to realize that the public school, the Y. M. C. A., the safety first department in industrial organizations, the welfare departments, have a part to play in the education of the adult workers. During the past year, we enrolled in the evening industrial schools of New York State 30,000 men who were employed at trades during the day. We had sixty-two separate and distinct trade courses in the evening schools — courses for ship-builders, courses for machinists, carpenters, electricians, printers, lithographers and what-not, and we are trying to get the men who are working at trades to appreciate first of all the opportunity within their own trade. A great deal of the difficulty and dissatisfaction among the working men of this country is a dissatisfaction due to lack of information. The plumber comes to the vocational school with his boy and he wants his boy to become an electrician. The electrician comes to the vocational school with his boy and he wants his boy to become a printer. The printer comes with his boy and he wants his boy to become a carpenter. Why? Because very few of the men realize the opportunity within their own trade. Our first job is to get the men to appreciate that there are unlimited opportunities in any trade. It is a question of training, of ability. It is a question of having a sort of education that will prepare the man for the position higher up. It isn't entirely a school problem. It is a problem of co-operation, it is a problem of bringing together all the forces in the state that are directly concerned. As we see at the present time, it is the problem of the school man, the employer through his association and the employee through the unions, and we are trying to work out a plan of co-operation in every city in this state whereby we will have a representative board made up of employers, employees and school people. We have the existing machinery for taking care of industrial cripples, and we wish it might be possible for the local school people to co-operate with the safety first men, the welfare men, in the training of the industrial cripples in New York State.

We have special buildings; we have thousands upon thousands of dollars worth of equipment; we have the best instructors it is possible to secure, men who have had a long and successful industrial experience, and our resources and our facilities are at your disposal if we can work out some co-operative agreement whereby the industrial cripples of the country will have the advantage of coming to the schools for direct training under personal supervision.

We may be able to assist you in the follow-up work. I think that practically all the experience of this country shows that industrial cripples, unless they are assisted in every way possible and followed back into industry, drop step by step until you find them on the street corners selling pencils and begging and doing all sorts of odd jobs. We all know that a cripple is not a man in terms of earning a man's full salary. He brings additional risk to the plant. There is no provision under the liability law or under the workmen's compensation for an industrial cripple. He is discriminated against; many times individual employees pick upon him; they make life unbearable, and as a result he gives up one job and drops step by step to the lower standards and lower types of work.

If we could co-operate in meeting this problem, I feel sure that we could help you in the training of industrial cripples and I feel sure that you could help us in solving the problems of industrial training that we are facing at this time, and it is only through co-operation, with an understanding of each other's problems, that we are going to work out a program that will in any measure meet the problems of reconstruction that we are facing at this time.

COMMISSIONER MITCHELL: We will now have the pleasure of hearing an address by Mr. R. M. Little, Director of the American Museum of Safety, New York City. He will discuss the subject, "Who Should Bear the Cost of Rehabilitating Workmen?"

WHO SHOULD BEAR THE COST OF REHABILITATING WORKMEN

BY R. M. LITTLE, DIRECTOR, AMERICAN MUSEUM OF SAFETY, NEW YORK CITY

Mr. Chairman, Ladies and Gentlemen: Before discussing the immediate topic assigned to me, would you permit me to speak a few general words as to how fundamentally important it seems to me this whole program of rehabilitation is for our country at the present time? It is a rehabilitation program including rehabilitation work for the soldiers and sailors disabled in service and soon to be discharged, and likewise a national scheme for the rehabilitation of the victims of industry in order that we shall salvage our human waste and work out more complete justice both for the soldier and sailor and the workman injured in industry.

If I understand aright, we are in danger just now of experiencing a let-down from the high idealism which has governed our country for the past eighteen months, and perhaps history will repeat itself in a sorrowful way and we shall have in our country something of that which President Lowell spoke of the other day when he warned the students of Harvard of the imminent danger of a moral backwash.

He cited the fact that just after the Civil War, which was waged for the preservation of the Union and the freedom of the slave, a war which was also one of idealism and democracy, it was immediately succeeded by selfishness and exploitation of natural resources and of certain classes, and we experienced for more than two decades a moral backwash which blurred our ideals and brought scandal upon our nation. This is always something that is to be feared after a great country or a group of people or an individual has been keyed up to the highest and to the best in a heroic struggle. There will be a reaction from it and a subsidence to a much lower level of thought and endeavor and morale. Therefore, a rehabilitation scheme, it seems to me, will play in at the present time with our broad national need to keep us true to our ideals and the practical working out of the spirit of democracy for which we have shared in this great world struggle. We need some moral safeguards for society as a whole, as well as the immediate benefits to be conferred upon the soldier or sailor or the working man who may have been injured in the shop, and this work of rehabilitation, if it can be broadly and wisely and practically done, will give us something to think about and to strive to accomplish that will keep our hearts warm and our spirits generous and our vision clear in the immediate perplexing days into which we have now entered.

Have you not discerned (it seems clear to me) that we, even in this hour in which we are talking, are commencing to see all over our country the signs of a little let-down and a sort of disintegration? Disintegrating processes are taking place during the period of readjustment or reconstruction which are taking place, or which must take place.

Now, in the midst of it all, ladies and gentlemen, we need some strong controlling principles and work to center our thought upon what will keep us keyed up a little bit more fully to the heroic things for which we have striving in the past eighteen months.

The work for the soldiers and sailors has been splendidly planned. I shall not touch upon what has been said before more than to mark that it has been built upon the work which was done in France and Belgium and England and Canada.

The Surgeon General and his staff and the Director of the Federal Board and his staff have made a careful study by literature, and by journeys into other countries, of the methods and ways in which those countries are striving to meet the problems of doing full justice to their soldiers and sailors disabled by service. It is one of the inspiring things of the countries that have been at war that they have this great thought — trying to do something for those who have braved their lives in defense of their countries.

I had the pleasure of spending two weeks at Ottawa, Montreal, Toronto and other Canadian towns, there observing the fine work the Dominion had sketched out in trying to do everything possible for the soldiers and sailors, and the way in which the Government officials and the splendid men and women of the Dominion were all working together to this practical end. Our Government and our country have made schemes built upon their experience but adapted to our national life, which perhaps will do as well for our boys as it has done for theirs. The idea is to do as fully as possible complete justice to the men. That was sketched in the War Risk Insurance Bill in part, providing for family allowance, separation allowance, compensation for physical disability and a life insurance scheme at a minimum cost, but those four points do not work out full and complete justice to the soldier or sailor disabled in service because when he comes back he has been wounded or shell shocked or used up in one way or the other. He can draw his compensation upon the basis of his physical disability; he may have the care of the Government in that way, but he has been disqualified to follow his former occupation or, perhaps, to follow any occupation gainfully. Therefore, the country owes to him a new chance. He did everything that he was called upon to do to preserve the honor and the rights of his country. Therefore, the whole corporate body of people represented in the Federal Government owes to him a new chance through a re-education that will fit him to follow a gainful occupation that he may occupy an independent place in society. There shall not be taken from him his compensation, but added thereto an education that will qualify him to be a useful workman, a useful professional man, that he may have his independence throughout all his days. We owe him that — not an old soldiers' home. We do not owe him nor should we tempt him with old soldiers' homes as we did the veterans of the Civil War.

It would be an indictment of our intelligence, and the loss of fifty years' growth of intelligence, if we were to repeat some of the mistakes that were made just after the close of the Civil War.

Those young fellows who have gone overseas and have gone through what they have, and have suffered these injuries, have got stuff within them which will make heroic men in the civil pursuits of life if we treat them right.

Of course, it is patent that there will be a moral backwash for them. They will be subjected to all the temptations and dangers of our over-generous and unwisely thoughtful life. We will want to make such heroes of all of them, I suppose, and there will be such various social methods of dealing with them that a good many of the splendid fellows will be stranded and useless before they know it, unless we have our rehabilitation schemes working strongly in all parts of the country, carefully articulated and following up every last one of them that the very best may be done for them.

I regret that we were so late getting the scheme under way, but the American Congress sometimes works slowly, and the American groups of people are difficult to get together, but it was finally done.

I am going a little bit apart from my immediate topic, but I wanted to speak to you about it because it is a sort of introduction to who shall bear the cost for the rehabilitation of these disabled persons in industry and otherwise.

Now for the soldier and the sailor it is, of course, obvious that the Federal Government should pay that cost and no tax be levied upon the State, and certainly it shouldn't be left to private generosity or groups of philanthropists to pay for the re-education of our soldiers and sailors. The country owes it to them on the basis of justice, owes it to them on the basis of a sound national, economic and social order, owes it to them generously and at once. The Federal Government must completely, or as far as possible, re-educate the disabled soldier and sailor and make him a fit unit of the economic life.

I want to go further and say that I think the Federal Government owes this to them and something that is not yet provided for but which every official of an industrial compensation commission and every business man will be concerned about, namely, that the Federal Government owes it to the soldier and sailor disabled in service to see that he is not reconstructed physically by the Surgeon General's office, retrained by the Federal Board, prepared for a job and then the door shut in his face so that he can't get a job because of his physical disability incurred in military service. The manager or proprietor may not want to give him a job because of the supposed increased liability to another accident. The State scheme doesn't, perhaps, cover that.

It is my view that the Federal Government should cover every one of the soldiers and sailors who have been disabled in service and are discharged honorably and are receiving compensation on the basis of physical disability from the War Risk Insurance Bureau. They should also be covered by the Federal Compensation Act for subsequent injuries received in industry.

I will not enter into that technical question because it involves too many side talks, but it seems to me to be the only way to make the plan work, for it won't do simply to re-educate them, arrange with the best technical schools we can, put them under the care of the most competent teachers, put them out in private industry to finish their courses as they do in Canada, and then, because the problem of compensation isn't cared for, have them denied jobs or soon to lose them. Employers, managers, will soon have to be governed by economic principles. They can't altogether be controlled by the spirit of patriotism and good will to the soldier boy. That will last for a little while, but it will not last long nor cover the years of disability. I believe the country ought to put a premium on them in order that they may receive a job and keep it.

I had some experience for about twenty years in connection with handicaps in industry and striving to get them jobs. I know perfectly well from experience the point of view of the handicapped fellow and how discouraged he gets, not merely because of his physical handicap and his lack of skill or adaptability to a trade, but also because of the handicap which rests upon him in the public mind — that he is a permanent cripple, that he is not of much use, and the handicap that rests upon him at the desk of the employer — that he doesn't want him. I know what that is from personal experience, and these schemes will not work easily. They have to be thought out, step by step. The soldier and the sailor are entitled to it. He should be guaranteed at every step of the way by the Federal Government a right and an opportunity, if he will take re-education and follow a gainful occupation, as an independent citizen and not be rotting as a pensioner on the public bounty.

Now, I want to talk with you a little while concerning who shall pay the cost for the rehabilitation of persons disabled in industry or otherwise. It is perfectly obvious, is it not, that the disabled man or woman himself, or herself, cannot pay that cost. I think we must recognize this at once, that the disabled person from industry, man or woman, seldom, if ever, is able to pay for the course of re-education that will qualify him or her for his or her former or a new occupation. Occasionally we see a man who can do that. Sometimes we seen a man's family who can help him to do that, and we have a number of illustrations all over the country of how, through rather superior intelligence, young men and women, or disabled men and women, by pluck and will power have qualified themselves by education or training for another occupation and have gone to the front in it, and have seen that their physical handicap was a spur to superior endeavor, mentally or otherwise, and they have succeeded in a magnificent way. But those are illustrations of a few only, because the great majority of those who are disabled in industry, and otherwise, have not the money, they perhaps haven't the initiative, they haven't thought it through, and it is perfectly hopeless to expect them to pay the cost for their re-education and their replacement in industry. I think we must absolve them from that responsibility. I think that they have done their part when they contribute themselves to a scheme which is well worked out by the public in their behalf, and if they will cooperate with it intelligently, putting themselves wholly into it and then, inspired with some ambition, go forward with the public assistance that they receive, we are asking of them about all that we can legitimately.

I have covered the question of the disabled man's family. It is not often able to help him; occasionally it may be, or some of his relatives or friends may be, but as a general scheme we may as well put aside the families of injured working men as not able financially to help them get retraining for a new job.

Now, let us come to the employer. If a man has been injured in his mills, shouldn't he, therefore, provide some scheme of restraining and re-education fit to put him in some other part of his own shop, or in some other place in the industrial life? That is being done to a small degree by employers. Again and again, men are injured on the railways or in the car shops, and then they are turned into some other line of employment in the transportation system. Brakemen become telegraph operators, etc. That same process is taking place, I suppose, in the steel industries and the building trades and the various other trades of our country to a certain small extent. Employers are providing either a retraining or a new opportunity in some other line for a man who has been disabled in industry and thereby disqualified to follow his usual occupation, but all that the employers have done and all that we may expect them to do isn't a beginning in the problem that is before us — the multitude of disabled and discarded people who are entitled to a retraining and to a new chance and better treatment than we have been according to them.

We might say that there should be incorporated in every state compensation act, first by the measure of money required of the employers or insurance companies, provision for a fund that would accumulate and which could be used by the State Industrial Commission to provide schemes of retraining for the men who come before them. I suppose that Chairman Mitchell and the other members of the State Industrial Commission here have thought with all the rest of us, as they have passed upon claims for compensation and awarded perhaps $66 per month to a man who had been earning $100 or thereabouts, that they were glad they had the compensation law, glad there was no continued litigation about it, and the man was going to get the money for whatever period the award was for, but every one who has been dealing in compensation for any length of time, and is thoughtful, has this feeling also — that compensation in itself, while it is just and right and ought perhaps to be more liberal in its scale than in most of our states, yet, with all of the good that is in it, it is not sufficient. It is not sufficient! I want to say that I felt pleased to be in it for a while. I like to watch its working and the monetary benefits going to men and their families, but my mind got to running over to the prevention side, to safety, so strongly that to-day I am in safety. I am still interested in the other side and I talk to you upon it, but if I could, I'd like to say, "Oh, for Heaven's sake! In this twentieth century after the close of the world war with all of the suffering and pain and anguish and loss that has come into the world, let us use our intelligence and coordinate it to *prevent* suffering."

While I stand before you to-day to plead for justice and right for the disabled soldier and sailor and the disabled working man, I say that it will be an indictment of our civilization, of our science, of our democracy, of our Christianity, it will be an indictment of our whole national life if we don't develop better methods of prevention in this country in the coming days than we have experienced in the past.

I have so many side thoughts that it is pretty hard to get back to this proposition of who will pay the cost. I have said that the working man can't pay the cost, his family can't pay the cost, his relatives ordinarily can't pay the cost. I was discussing the question of the State Compensation Commission or Industrial Board paying the cost. That might be fairly good if we were debating the question in one State and labor wasn't fluid and didn't keep moving back and forth across the State lines and the whole thing hadn't become a national matter rather than a local or a State problem, and if it wasn't such an impossible thing to get forty-eight State legislatures to think through the problem and act intelligently on it. Therefore, we have got to go to a center to commence to scheme something nationally that will, perhaps, give to us a measure of satisfaction and success in dealing with this very intricate and baffling problem.

Therefore, we lay them all aside and say that the leadership in this work must be assumed by the national government. Uncle Sam must put his hand to the wheel and evolve something and work out some national scheme that will fit the needs of all the various States with which they can cooperate and be a part of. Those of us who quote statistics do not very often agree because the sources do not all agree. I observed last night some of Mr. Beyer's statements as to how much he was in the right as to some figures I had in mind, and then I observed some figures that the Chairman of the day gave from Major Mock's letter and I scratched by head and thought, "Where *do* we get them?"

Without attempting to be accurate, but giving you a conservative estimate rather carefully worked out with some who are in touch with sources, we have in this country each year over 2,000,000 lost time accidents in our industries, not including our street accidents, not including agricultural accidents and household accidents that are not reported. Now, of the 2,000,000 lost time accidents reported, we have, I suppose, 750,000 of them where the loss of time is one month or more. We have about that number of lost time accidents — 2,000,000 — and we have 22,500 industrial deaths. I observe that Mr. Beyer said it was 35,000 industrial deaths. We have more deaths from street accidents, agricultural, household, etc., than we have perhaps in the industries that are reported. I suppose there are in the country some 60,000 to 80,000 deaths.

Coming back to the report of accidents and figuring functional losses in relation to deaths, we have, at least, about 12,000 men in our industries each year who are suffering functional losses, hands, arms, legs, eyes, because of accidents taking place in industry. It may be more than that, but that is conservatively speaking. The ages of the men average about thirty years or a little more. If that be true, you may say there is a period of ten years in which men would be retainable, not, perhaps, all of them, but the majority. That would give us at any time in our industries more than 100,000 men and women who are entitled to a re-education and a new chance in the industrial life and not to be cast aside as human waste. A certain per cent of them are being retrained in methods which are already indicated, but we haven't any scheme which meets it in a strong way. Our private attempts to do it are utterly inadequate. I know that because I have tried it.

I remember one time out in Chicago about twenty odd years ago we were very much perplexed as to what to do with handicaps. We had the usual experience of them being displaced from industry and we were doing the best we could for them and some of them were fine fellows, but gradually they tumbled down from one stage to the other. In the midst of our perplexities some one proposed that we start a bureau for the handicaps of Chicago, get in touch with the industries, locate jobs, enlist the cooperation of the employers, and the press, and the pulpit, and the different strong forces of society, and see if we couldn't develop processes that would lead somewhere with these hundreds that we observed around about us and who needed a new chance. A newspaper reporter heard of our scheme before we had it worked out and before the little bureau was established and just as we engaged a secretary, there was gathered around 79 Dearborn street a mob of men and women numbering more than are in this room this afternoon. They came from miles and miles distant to our little bureau to try to get jobs.

We had the same experience in New York; we had the same experience in Philadelphia. I want to say that unless you put yourself in the center of this problem for a while, you haven't any idea by figures alone of its poignancy and the way in which men and women want to work, but the way the industrial system is schemed and organized and conducted they don't have a chance to work, and they are not going to have until they are re-educated and retrained and followed up in a friendly way and put where they can demonstrate their ability. I believe a considerable portion of them will do very well if we give them a chance.

Here are 100,000 more of them ready at this immediate time. We have had about 260,000 casualties in the army during the war all told, 50,000 deaths. Major Mock stated there would be about 50,000 of them subject to reconstruction physically, and there will be about 10,000 of them turned over, when discharged from military service, to the Federal Board for Vocational Education to be placed in the various technical schools under experienced teachers and then to be followed up and given jobs — about 10,000 of them. In other words, the great war in which we have all been tremendously interested and engaged, to which all our thought has been running, has only brought to us in eighteen months one-tenth of the problem for re-education and retraining and placement that industry has ready for us to-day if we could begin the job — only one-tenth of it.

Who should pay the cost? The Federal Government. When we were getting up that scheme for the soldiers and sailors, we had incorporated in the Smith-Sears Act a provision for the victims of industry, but when the measure was presented to the Council of National Defense and to the Cabinet, they took the position that it was unwise to include that provision in it at the time as it wasn't obviously a Federal responsibility, that the administration had been asking a great deal of Congress, and that it was imperative that the measure for the soldiers and sailors should be enacted at once and the organization effected speedily, that this provision could follow, but provisions for the soldiers and sailors must come first. With that understanding we went to the hearings in the Smith-Sears Bill and presented the claims for the victims of industry. We met the same view there which we had received from the Council of National Defense and the Cabinet, but also this encouragement — "Prepare your bill, gentlemen; we will introduce it in the fall and then we can get together behind it and include a provision in the Federal legislation for the victims of industry." Indeed, the interest in the subject was so great and broadspread that one of the Congressmen, one of the members of the Committee of the House, introduced the measure upon the 12th of August. It wasn't in good form and was not a complete bill and, therefore, through conference a better bill has been prepared and was reintroduced by the same man in the House on September 4, and introduced in the Senate by Senator Hoke Smith, whose name is attached to all of these educational bills, the Federal Board bill, the Soldiers and Sailors bill. The Senator is much interested in all of them and has given his name and his influence to them.

The high points in this bill are simply these: To extend the jurisdiction of the Federal Board for Vocational Education to include in their scheme some provision for persons disabled in industry and otherwise, the same as has been provided for the soldiers and sailors, with these exceptions: This bill, House Bill 12.880, is designed to be a cooperative measure between the Federal Government and the State governments, recognizing that the responsibility to retrain the victims of industry is really a State responsibility more largely than it is a Federal responsibility, but that the Federal Government needs to take the leadership in it to devise the scheme and assist the States that they may all cooperate with it as far as possible upon a fifty-fifty basis, the same as the Smith-Hughes Act which established the Federal Board for Vocational Education. It is the same principle of legislation throughout. This year, the first year, up to July the bill would appropriate $500,000 to be allotted to the States according to population, and no State to receive less than $5,000. For the succeeding year to be appropriated by the Federal Congress $750,000 and the next year $1,000,000 and $1,000,000 each year thereafter.

The Federal Board for Vocational Education would be the leader in devising the scheme for the retraining of disabled people and would cooperate with the State Board for Vocational Education, usually the State Department of Education with a vocational side to it, or, where a State has a distinct Vocational Board, it will be that Board. This Department of Education, or Vocational Education Board, shall in turn cooperate with the State Industrial Commission or State Compensation Commission, or whatever agency in the State is charged with dealing justice by this means to those who are disabled in industry.

It puts the Federal Government at Washington with good leadership in touch with the various commonwealths of our country to work out a scheme of re-education and retraining for all those who have been disabled in industry or otherwise and are able to take retraining for the same or a different occupation. Those are the main points in the bill. The physical provisions of the bill only provide for the system of re-education, the teachers, the courses, etc., not the maintenance of the men during the period that they are taking the training.

In the State of New York, perhaps the compensation a man is receiving for the loss of an arm or a leg might permit him, particularly if he were a single man, to go to the schools which the State Board of Vocational Education will provide and go through a long course there and really live while he is taking that retraining. If he is a married man, the compensation would not be adequate for his family and for his own needs. Therefore, it is going to become a State problem on that side of working out some adequate physical policy to provide for the varied needs of disabled people in order that they take their retraining. A good deal of State initiative, therefore, will be required to make it work well.

I am only talking about a bill, not a law. The bill has been introduced, it has been considered by different ones interested in it, and a hearing — a public hearing — is to be held in the Senate Office Building in the Committee room of the Committee on Education and Labor next week, the 10th of this month. It will, perhaps, be a joint Committee of the one in the Senate and the House as it was in the Smith-Sears hearing, in which all people who are interested can be heard if time permits; especially public officials and others who are interested in this form of legislation need to lend their endorsement.

As Mr. Mitchell said, the bill itself is not here for debate this afternoon. It is susceptible to improvement and will, no doubt, be changed in many ways in the hearings and subsequent discussions, but if you agree that there is this broad national need, that we require national leadership to pay the bills, the money must come from the public treasury of the Federal Government and the State governments, that we should salvage our men injured in industry and otherwise and reconstruct them and rehabilitate them and inspire them to live independent lives and not to become shoe-string peddlers and lead pencil beggars. Let me plead with you to come and give to this bill your support and your endorsement, and you can do it in a most potent and telling way by writing a letter to the Senators of this State and to your Congressmen. Tell them that you are interested in the Bankhead-Smith Bill, H. R. 12,880, that you hope they will lend their influence to see that it is passed in the proper shape, that you want to see another chance given to the victims of injury in industry, that society has not been dealing justly by a large fraction of its population and that we need this as an after-the-war measure, we need it as a permanent part of our national policy. And I say to you that we will get action down at Washington even if the tendency is to retrench.

I am delighted to see how many letters are going to the Congressmen and Senators of New York. I am sure that is what your applause means.

Well, who pays the cost of rehabilitating the disabled workman? Why, he pays it. Are you sure? Well, his family. Are you sure? His relatives. Are you sure? Well, his lodge. Are you sure? They may in a few cases now and then, but I want to say to you, and I want you to get this, that you and I are paying the cost. That is the long and short of it. We are paying it privately, we are paying it publicly, we are paying it in our eleemosynary institutions in dollars and cents. We have got to pay our bills, we have got to pay for the wastage of society. If we don't pay it one way we pay it another way. It is simply a question of paying it in an intelligent, constructive way or paying it in a blighting, despoiling way. That is the only question before us in the last analysis. We pay the bill, we either pay it one way or the other way.

Let us have a constructive policy to deal with the baffling problem and pay it in a constructive way and make every dollar multiply itself, make every citizen an asset to society and not a liability. The assets have always got to pay the liabilities in every solvent institution, and every commonwealth in our country is solvent; therefore, the assets of every State are paying for this great wastage and they are paying it not only in dollars and cents but in a lowered tone of our citizenship because many of these people who are injured are hopeless and discouraged. We see them — a few here — a few there — in the streets of our cities. They become a source of social and economic infection which breeds weakness in our whole structural life.

I had the rather unique and unusual experience, during the last two years of the Blankenburg administration in the city of Philadelphia, of taking off the streets of that good old Quaker City 1,365 mendicants, and during that process of taking off the streets of that city 1,365 mendicants, I came personally into contact with scores of handicaps and learned their stories. By my own investigation, and by the investigations of the officers and our workers, I know something of the life of the handicapped beggar, and shall not speak of it further — it isn't anything of which to be proud. But the beggar is not the only one to blame and often he is not as much to blame as the thoughtless and unintelligent social environment which is around him. We have made our generosity and our alms a temptation to the weak and the poor when we ought to invest our hearts and consciences and purses in great national and state policies that will get to the roots of things, stop them at the sources, if we can, deal with them intelligently afterwards, reconstruct and salvage the lost human, and then we can call ourselves an intelligent, progressive civilization.

GENERAL DISCUSSION

Commissioner Mitchell: Ladies and Gentlemen: I am sure that the formal addresses delivered this afternoon by the very able speakers have proven to you, as they have to me, both interesting and illuminating.

The program now calls for general discussion of this subject matter of industrial rehabilitation and while, of course, it is not either the province or the intention or desire of the presiding officer to indulge himself in discussion of these questions, I am sure you will be patient with me if I add, even though inadequately, my own word of appeal to the men and women assembled here who are representative of the industries and of the working men of the State of New York and of the best thought, the best scientific thought, perhaps, of the State of New York — that you shall take some formal action that will be helpful in securing the passage of the Smith-Bankhead Bill. I do not suggest its passage necessarily in either its present form or as we have seen it previously, but that the bill, if it is not in the best form now, shall be perfected and then passed by our Congress.

I was profoundly impressed with the thoughts expressed by Mr. Little. To make provision to alleviate the suffering is not alone justice to the person who is crippled and suffering, but it must be a source of happiness to those who are well and those who are not crippled, it must be a source of safety to them.

A great philosopher once said that a free man is one who lives in a country in which there are no slaves. If I might paraphrase that expression, I should say that a really happy man is one who lives in a community in which there is no avoidable misery; in other words, a man cannot be happy, and does not deserve to be happy, if day by day he meets men and women who are suffering from disease or accident or from misfortune. I am quite sure that no right thinking man has ever passed a cripple on the street selling lead pencils or begging money that he has not reflected that this is a most unfortunate circumstance, or that that person was a most unfortunate one. In other words, we become unhappy ourselves because other men and women are unhappy, and I should say that if it were from no other standpoint than the satisfaction of our ownselves, as a contribution to our own happiness, we should do whatever lies within our power to restore these crippled men, to make them self-sustaining and, therefore, self-respecting.

It is, perhaps, true that under our compensation laws men receiving benefits feel, as they should feel, that they are only receiving that to which they are legally and morally entitled. Nevertheless, there are large numbers of crippled men, men crippled in the course of their employment, who are paid compensation, who still feel that they are dependents upon society and hence they suffer the moral pain and the mental humiliation that men always feel when they are dependent upon charity or upon incomes that are not earned by themselves. I say it is unfortunate that the men should feel that way in regard to compensation laws because, as a matter of fact, they are receiving, and receiving inadequately, that to which they are both legally and morally entitled.

I trust that the discussion of the subject this afternoon may result in a unanimous judgment on the part of the representatives here that this bill, either in its present form, or in a modified or amended form, should be passed. I second the suggestion of Mr. Little, that all those who believe that this measure should be passed should write personally to their representatives in Congress. My own experience has been, both as a lobbyist before the State legislatures and before the Federal Congress, that Congressmen and Legislators respond better to individual letters from constituents than they do to resolutions adopted by bodies of men. A Congressman, or a member of the Legislature feels, when one of his constituents writes him personal letters, that that constituent must be keenly interested in the subject upon which he writes, otherwise he would not have gone to the trouble of writing at all, whereas resolutions involve no effect at all except to say yes or no on the part of the voters who may be assembled in any body where a resolution covering the subject is introduced.

MR. M. A. DALY, Secretary, Associated Manufacturers and Merchants, New York State: Mr. Chairman, prior to the opening of the discussion on this question, I think it would be advisable to propose a formal memorial for this body, and I am proposing such a memorial on behalf of Mr. Carleton A. Chase, who is President of the Associated Manufacturers and Merchants. While that in itself is good enough, I am going to ask the Chairman of the meeting and the President of the State Federation of Labor if they, too, will lend their names to this memorial and let it be before the meeting so that in the discussion which will follow they will have in mind the eventual adoption or rejection of this memorial. I would like to have the record note that this memorial was introduced by Honorable John Mitchell, Chairman of the New York State Industrial Commission, Carleton A. Chase, President of the Associated Manufacturers and Merchants of New York State, and James P. Holland, President of the New York State Federation of Labor, jointly. The resolution or memorial is in follows:

> Having to-day, in convention assembled, considered the subject of the vocational rehabilitation of maimed workmen, the New York State Industrial Safety Congress herewith memorializes the committee of the Congress of the United States, to-wit: That the Industrial Safety Congress hereby endorses the principle of the Smith-Bankhead Bill, so-called, with recommendation for its passage by the Congress of the United States after it has been carefully considered in its relation to the employer, the employee and the public.
>
> The secretary of the Congress hereby is directed to forward to the Congressional Committee a copy of this memorial.

Motion made and seconded that the memorial be adopted.

Commissioner Mitchell: While the motion is pending, of course, it will be proper to discuss the entire subject matter now before the Congress.

Miss Harriet M. Miller, Syracuse: I would like to ask the gentleman who just spoke if, in considering doing something for the disabled soldiers and sailors, you have also considered the possibility of educating them in the arts, also the crafts. It seems to be a very important thing to let the fellow do the thing he wants to do. Our soldiers and sailors have been loved by the women as well as by the men and it has meant so much to them and has helped them to bring victory more than we realize.

I read a story the other day to some little fellows and I said to them, "There is a secret in this story and I want you to guess it." When I had finished I asked, "What is the secret?" One little fellow with his toes out of his shoes said, "She cared." That is the whole thing.

I would also like to know if it isn't possible to include in the program of re-education the teaching of the crafts and fine arts. That would do a great deal for them as well for the country.

Commissioner Mitchell: This particular bill that is now under discussion does not relate to soldiers and sailors. It is for the re-education of men crippled in industry or otherwise. The bill for the re-education of soldiers and sailors has been passed and is now in effect and there is no provision of that kind in it, that is, no provision which would necessarily prevent the education of men in the arts and crafts.

Mr. Robinson: Mr. Chairman, might I just elaborate a bit on the question raised? The Federal Board certainly does recognize that we shall not dictate what the man must do, but we shall try to find out what he is best fitted for and encourage him in doing that. For instance, one case has already passed through District Office No. 1 in Boston where a young man had begun a course of law. He was seriously crippled and obviously could not enter into any practical vocational work. He seemed best qualified to continue his work at law and has now been returned to Harvard to complete his study of law. That same point of view will be taken in considering every case on its individual merit, and it is certainly hoped and intended that men who are best qualified for arts and sciences shall receive their chance along those lines, not necessarily making vocational or industrial workers of them if they are not adapted for that particular work.

Mr. Little: Mr. Chairman, I think the audience should have an opportunity to hear Mr. McMurtrie on this subject. There is no one in the country who knows more about this. Mr. McMurtrie is Director of the Red Cross Institute for Crippled and Disabled Men.

Mr. Douglas C. McMurtrie, Director, Red Cross Institute for Crippled and Disabled Men, New York City: I just have one comment to make in discussion of Mr. Little's paper when he spoke of "Who shall Pay the Cost?"

I have one little suggestion to make that comes from a practical experience. We are operating a school now in which disabled industrial workers are being trained, and I might say that school is open to any and all crippled men in New York City. It isn't quite as simple, however, as it would look on the surface and the provision of a school with adequate facilities doesn't get the men all trained at all. The men don't show up and the classes now are not as full as we should like to see them. There are a great many influences that operate in that direction and, of course, it is perfectly clear to you that we will never get anywhere with the re-education of crippled industrial workers until the compensation legislation is radically changed so that there will be some premium on re-education, and some degree of self-interest to the man in taking it. I know that all the crippled industrial workers who show up at our place show up the day their compensation expires. For two or four years, or whatever it is, they sit in absolute idleness and when they are absolutely down and out, then they come to us for training.

It seems to me that one possibility is that of making a certain amount of compensation absolutely statutory — it can't be taken away from a man whether he improves his condition or not. If we don't change that condition, re-education will not be attractive to the man.

The first case of a given character which I shall describe has recently been turned out of our institute. It is a commercial proposition pure and simple. A compensation insurance company in Massachusetts sent a man to us a while ago and asked if they could pay his tuition. He was a man working in an industrial plant outside of Boston and was so disabled that that insurance company would have had to pay him a considerable degree of compensation for something like nearly ten years, but the compensation he would have gotten would not have been very attractive — somewhere in the neighborhood of, say, $14 a week. The man had been earning good wages, so the insurance company went to him and said, " Now, this is a business proposition between you and us. Fourteen dollars wouldn't be of any use to you when you have been earning $25, and you don't want to drop down on your living scale to that extent. We'll arrange to have you trained in oxy-acetylene welding and bring you back and get you a better job than you had before."

Instead of the small compensation that would have been paid to him, they paid him $20 a week and paid his wife $20 a week during the course of training. They paid his traveling expenses to and from New York. Then they started him out and put him in a job. The whole thing cost the insurance company something in the neighborhood of $500 and it saved them a great deal of money.

What was the result? The man is working now for something like $28 a week, more than he earned before the accident, and he is the gainer because it was no inducement for him to stay idle and draw a small compensation payment. The man is distinctly the gainer, the community is distinctly the gainer, because the man is transferred from the idle, unproductive column into the productive column, and as a business proposition the insurance company is certainly much better off. If some such scheme can be hit upon, nobody will pay the cost because what will it be but a transfer of bookkeeping of the money now being paid out without any commensurate gain.

[Commissioner Lynch takes the Chair.]

Mr. Daly:— I'd like to question Mr. McMurtrie as to the cost of rehabilitating workman aside from the tuition part — aside from the cost of teaching. Is there any material cost for appliances, for artificial arms, legs, fingers, etc.?

Mr. McMurtrie: There would be if they were required, but a great many injuries are not amputations and do not require the use of appliances. They require mostly a re-adaptation to a particular job for the man to follow. The chief expense in training industrial workers is during the course of training — their maintenance.

I meet a man out in the street, go to him and say, "I have a splendid school of re-education; come to it and we will retrain you for a job in which you can make $25 a week." He is only making $6 a week and he would like to come, but he can't do it, he can't take advantage of it because he would starve in the meantime. The maintenance is the greatest expense in the retraining of industrial cripples. You can cover that in one compensation or straight payment as this insurance company did.

Mr. Daly: Isn't it true that the cost of maintenance should be directly a charge on all the people rather than a charge on any particular portion?

Mr. McMurtrie: If the thing is properly adjusted, you already have maintenance covered because when a man is injured in an industrial plant, there is already set aside a financial reserve to take care of that accident. If the two things are tied up, if compensation is made constructive, there is plenty of money there already, and it is my idea that in some way a scheme can be worked out so that money, instead of going to idleness and demoralization, will go to putting men back into good jobs.

Mr. Daly: But that comes from one portion of the people. What I tried to make clear was that the public at large benefits so materially by the reconstruction of maimed workmen that the charge against that should be a charge on all the people rather than upon the employer, we will say.

Mr. McMurtrie: I think you can pay it out of the hazard reserve that the employer has set up as one of his costs of operation, and then, furthermore, you would have the employer paying the largest premiums, paying the most toward the cost of rehabilitating, which, I think, is also just.

Commissioner Lynch: It would seem, however, that inasmuch as the State, or its political divisions, is paying this tremendous cost to which Mr. Little called attention, the State at least might assume some of the share, if not all of the burden, of re-education of industrial cripples, but of this we may be sure, that if the right kind of a scheme is worked out, it is not going to make very much difference to the industrial cripple who educates him so long as he is put into a position to become a useful member of society.

Is there any further discussion of the papers that were read this afternoon?

MR. A. H. MOWBRAY, Actuary, State Insurance Fund: It seems this discussion has been largely from the standpoint of our duty to ourselves. It seems to me we are almost under a legal obligation to undertake this policy of rehabilitation by a direct contract with labor which we have made, which went into effect when we passed the Compensation Act. Nearly every one of our Compensation Laws are direct contracts. To my mind there is only one justification for the temporary benefit for permanent injury and that is that during that time the man will be able to rehabilitate himself, but it seems to me that limiting compensation to a term to enable him to rehabilitate himself carries with it the moral and almost the legal obligation to provide him during that term with the means for rehabilitating himself.

COMMISSIONER LYNCH: I have been wondering, since Dr. Little talked to you this afternoon, how many of you made a note of his request that you write to Senator Calder and Senator Wadsworth and to the Representative from your district, asking them to get behind the Smith-Bankhead bill, and how many of you made a note of the number of the bill as Dr. Little read it. I am also wondering, if Dr. Little gave you that data again, how many of you would make a note of it and write the letters and do something practical for industrial cripples aside from merely voting "yes" on this resolution that I am about to put before you. That would be a real practical thing and I would ask Mr. Little to again give the name of the bill and its number so that the notes may be made and these letters may be written.

MR. LITTLE: The bill is called the Bankhead-Smith bill. It was introdduced in the House first,— the Bankhead-Smith Rehabilitation Bill for Persons Disabled in Industry or Otherwise. It is House number H. R. 12,880. If you write to your Senators and your Congressmen, I am sure you will do a good work.

MR. GUSTAVE HAUSTEIN, American Lithographic Co., New York City: I might ask whether it would be beneficial to have additional letters from the corporation representatives or manufacturers, from the concern themselves, in addition to the individual letters. For instance, we could report to our companies at home and the President or some official of the company could write on behalf of the industry.

MR. LITTLE: Write yourself and get every firm you are connected with to write. I want to say that you are not working alone. The American Association for Labor Legislation has been earnestly promoting this legislation. The A. F. of L. have been interested in this legislation. The National Association of Manufacturers is interested in this legislation. The Red Cross has been interested in this legislation. The International Association of Industrial Accident Boards at their meeting in Madison, Wisconsin, in September, endorsed this legislation in principle, so there are a great many strong and influential organizations backing this bill. But all the letters you can pour in to your Senators and Representatives will be worth while.

COMMISSIONER LYNCH: Are you ready for the question? All in favor of the adoption of the resolution please signify by saying "aye."

The resolution is unanimously adopted.

The direction to transmit a copy of this will be followed by the Secretary of this Commission, acting for the Third Industrial Safety Congress.

This evening this subject will be further discussed at a meeting at which Dr. Andrews will preside. The subject will be "Restoring the Disabled Man to Self-support."

WEDNESDAY EVENING, DECEMBER 4

PRESIDING OFFICER: JOHN B. ANDREWS, SECRETARY, AMERICAN ASSOCIATION FOR LABOR LEGISLATION, NEW YORK CITY

CHAIRMAN ANDREWS: The session this evening is merely a continuation of the afternoon meeting and is devoted to the subject "Rehabilitating Men." Certainly it will be impossible to enlarge upon the general treatment of the subject as presented this afternoon. I am sure no one of us would attempt to picture more forcefully both to the heart and the pocketbook,— a rather unusual combination of appeal — this most urgent need than it was done this afternoon by Dr. Little of the American Museum of Safety.

It is, of course, apparent that out of the world war we are going to have a number of changes in the industrial field. War brings in its train many evils, but if we have the proper leadership with social vision, it will also be inexcusable if there are not great gains. One of the gains sure to come is the vocational retraining of disabled soldiers and sailors, also vocational retraining and rehabilitation of industrial workers. The Federal legislation, upon which there is to be a public hearing of the joint Committees of Congress on December 10, is but one indication of the public realization of the need. I know from requests that are coming from individual states over the country for drafts of bills that this subject is going to be one of the live ones in the forty-odd state legislatures that meet during this next year. The plan of the original Smith-Hughes Vocational Education Act of two years ago is for cooperation between the Federal Government and the state governments on a practical fifty-fifty or dollar for dollar basis in extending this much-needed vocational training. I think it was not brought out this afternoon in detail that the need for the Federal legislation is extremely urgent just now. Unless Congress does its part and passes legislation similar to that proposed in the Bankhead-Smith bill, it is going to be extremely difficult for the individual states to act intelligently in providing through legislation the necessary appropriations which they will be expected to arrange for before the full benefit of this Federal legislation can come into effect.

We must remember that of the forty odd state legislatures of this coming year most of them do not meet again until 1921, so in your letters to your Representatives in Congress in both houses it would, perhaps, be well to make that point — that New York will hardly be in a position to take the step that this body and the influential organizations have approved this afternoon unless our Representatives act without very much delay.

The question was raised as to whether this legislation needs consideration both from the standpoint of the employer, from the standpoint of the employee and from the standpoint of the public. Just to sketch in a couple of words for the benefit of the few who were not here this afternoon, I want to say that it seems to me that from the workman's viewpoint there must be two things guaranteed if this legislation is to be successful. First, self-help in this retraining must not be penalized by a loss of workman's compensation. There are, in general, three methods under our workmen's compensation laws of taking care of the workman for partial disability. Under the first (a very common method it is, too), the loss of earning power is used as the basis for determining compensation. It may be, as in some states, one-half of the difference between the usual wage and the wage resulting from the decreased ability and that is usually limited, of course, by a maximum of from perhaps $8 to $15 a week and for a limited number of weeks. This works rather unfortunately for the workmen in certain occupations, because no distinction is made as to the age of the employee or the specific demands of his work. The loss of an index finger may be a very different things to the linotype operator and to the ditch digger, and yet under that plan, which is very easy to administer, the proper distinction is not made.

Sometimes a specific injury schedule is put right into the law, and this makes no allowance for age or occupation, as thirty-five weeks' compensation may be paid for the loss of a finger.

The California Compensation Board has worked out a partial disability schedule which is a considerable improvement over the earlier methods where compensation is guaranteed even if there is decreased loss of earning power, and by a system of averages it is possible to take into account both the injury and the age of the worker and the occupation. That is the method followed in the soldiers and sailors insurance resulting from the amendment passed by Congress last spring.

The second demand, it seems to me, from the workman's viewpoint is for maintenance during the retraining. It is suggested that this might be provided through maintenance scholarships from a fund so that the worker could continue this process of training and there might be something for his family over and above the workmen's compensation which he would receive for a limited period.

From the employers' viewpoint it is clear that in order to make this whole system successful most of the compensation laws will need to be amended in order that compensation for total disability may not keep the employer from giving employment to those who are already partially disabled. It is a big question, I think, whether or not those who are partially disabled are more likely to suffer a second accident. At least, that is one of the disputed questions.

Dr. Farnum in Illinois declares that a man who has suffered one injury is so much more careful thereafter that accidents will really be less on that account, but there appear to be reasons also for thinking that in some trades there is extreme danger in employing people in specific occupations if they have suffered from very severe injury before. The extraordinary compensation due to the cumulative effect of successive injuries is a real problem for employers, although the cases where such compensation would have to be paid are relatively few. The employer must in many cases approach the question in this way: This workman who applies for the job has already lost one eye or lost one arm. That compensation presumably has been paid, but if he loses a second arm or a second eye while in my employ, he will be totally and permanently disabled. In that case the compensation to be paid is much higher. The Commission has found it necessary, before granting a permit to the employer to take care of his own rights under the compensation law, to request that he sign a pledge that he will not discriminate against the partially disabled applicants for work.

The other systems of taking care of this problem are four. One is proposed in the legislature of Massachusetts, or it was proposed last year and fortunately was lost. Several states regard the loss of an eye, even if it is a second eye, as worth one-third of the wage. This, of course, is unfair to the workman and to society, but it does relieve the employer. This comes under the second system — that the partially disabled workman might waive his right to claim compensation if he suffered a second injury.

Third, the employer is liable for combined effect less the effect of the first injury. In other words, the employer in this case would pay, perhaps, 67 per cent and the other would have been cared for under the earlier accident, but this seems hardly just to the employer. So, in two states only in this country has a plan been worked out and put into effect which appears to meet the case. In New York, in the case of an employee being killed in industry who leaves no dependents, $100 is put into the state treasury and this forms a sufficient fund to pay this extraordinary compensation resulting from a second injury causing total disability. In Ohio, where they have the simple state fund system, they have instituted a plan beginning last July which puts this extraordinary compensation burden upon all the industries of the state. It is simply paid from the general fund.

Mr. Little made a very strong case this afternoon for a Federal fund to take care of the extraordinary cost in the case of war cripples. It is quite probable that a plan could be worked out to extend the same kind of protection to the employer, the employee and to society in general through an extension of the war cripples' compensation fund.

I merely want to mention these things because they are problems which will concern us very much during the next six weeks. In fact, I know of national conferences which are going to devote a good deal of their attention to the technical problems involved in these questions I have just mentioned, and to the drafting of bills for reintroduction next January.

We have the great privilege to-night of having the process by which benefits are to be secured in rehabilitation pictured to us.

About ten years ago, when I went to New York City to live, a man came to my office and I learned in a very few minutes that his hobby was cripples. From time to time during the ten years I have had the opportunity to follow his work, and I was not surprised when last spring I appeared at the hearings in Washington on the Soldiers and Sailors' Rehabilitation Bill, to find the same man there with a well-developed vocation, and it was still cripples. To-night we are going to see the movies, and Mr. McMurtrie, who is the Director of the Red Cross Institute for Cripples and Disabled Men in New York City, will give us a talk on the methods by which such retraining is carried on. Mr. McMurtrie.

RESTORING THE DISABLED MAN TO SELF-SUPPORT

BY DOUGLAS C. MCMURTRIE, DIRECTOR, RED CROSS INSTITUTE FOR CRIPPLED AND DISABLED MEN, NEW YORK CITY

Mr. Chairman, Members of the Congress: In speaking to the troops that saved India to the British Empire Sir Henry Havelock said, "Soldiers, your labors, your privations, your valor, will never be forgotten by a grateful country." He meant what he said and the people of England meant at that time to back up his assertion, but eighteen months later, I venture to say, those heroes were nothing but nuisances to the public, to their employers and to the community at large. So it has ever been, and the easy gratitude that we extend to soldiers during the war and soon after war time is very transitory. Only recently has there been anything constructive on the problem at all. Of course, you know in the older wars the disabled soldier was taken care of in no way whatsoever, and not until the Napoleonic era was any provision made. About that time there came into being some old soldiers' homes and there the ex-service men were allowed to live. When those homes became so crowded that they could no longer accommodate the men who needed their asylum, they began to send some of the inmates out and give them a yearly grant to live outside and make room for new pensioners. That was the genesis of the pension system, and from that has grown up many elaborate pension scales by which the nations have sought to remunerate the soldiers for injury suffered in service. I need hardly point out to you that the pension is no real help to a man who wants to get back on his feet again. It provides him a niggardly allowance on which he can never live, and it just about serves as an incentive to exist in idleness.

The pension system, I think we may say, is clearly a failure, and until something else is introduced with it, we are not treating our disabled men properly. The idea which we have now come to, and which we all know to be correct, is the only real compensation for disability — rehabilitation for self-support. But that has only been tried in the last ten years. Just exactly ten years ago there was started by one of the provinces of Belgium a training school for industrial cripples, but, strange to say, nothing else was done between that date and 1914, the opening of the European war. A stern necessity was introduced with the beginning of hostilities in that no longer were armies raised and sent away to the front but whole peoples were called to the colors and every able-bodied man was sent away, and it became desperately hard to keep the industries of the country in operation. So they began to look around for new sources of labor, and one of the sources which they found were the disabled men who were already returned from the front, so the mayor of Lyons, France, started in September, 1914, a training school for war cripples which has since been christened "L'école Joffre" and which was the first school of its kind in the world. It has proven the inspiration of, and example for, other schools of which there are 130 in France alone and a commensurate number in other countries.

We say that we take a disabled man who is incapitated and cannot return to his former occupation and train him for a new occupation in which he will make as much money or more money than he made before. We have heard a great deal about this, but I think that when the statement is made the usual reaction is incredulity. I think the thing that will most clearly show you and make clear to you whether it can or cannot be done is to cite a few instances.

Briefly — we forget the man's disability and we seek to find his remaining abilities and we try to match up with those abilities a trade which only requires them and does not require any functions which have been lost.

Let's presume we have a man back from the front who has had some experience in the printing trade. Both legs are amputated above the knees. He will be rated by any Workmen's Compensation Committee as totally disabled, and, theoretically, in the past we would expect to lay that man aside on the shelf to do nothing the rest of his days.

On the other hand, let's take a familiar line and let him be a linotype operator. He can go down to the newspaper concern and earn his $32 or $35 a week and turn out as much product and as good product as the man sitting next to him who has all his legs with him. In other words, we have introduced him into a seated job and he is no longer a cripple where he uses his head and his hands. He is not handicapped. I saw in an automobile factory not long ago a man working at a job of painting or applying some compound to a string of engines passing by on an endless belt. The man on that job has one hand in his pocket and paints with the other hand. That would be an ideal job for a one-handed man.

Blindness is considered a very serious handicap. What shall we do with a blind man? The solution in the past has been that they can cane chairs, make willow baskets, perhaps weave carpets and rugs. They do that all over the country in institutions for the blind. Are you going to do that with your blind man and let him earn $6.50 a week? No! We can go into the skilled lines and place him there simply by looking for jobs in which the eyes are not used.

I saw in a report from abroad the note of a clock factory, and in this clock factory blind men tested the spiral gongs which went into the clocks. They used two senses, the sense of touch and that of hearing. Those senses are even more acute in a blind man than in a man with eyes.

One of our employment people reported the other day that he had found a factory in Brooklyn where they placed a premium on blind men for assembling insulators, taking porcelain pieces and putting them together with other parts. The employer told us that before when he had used people with sight on that job he had to have a force of inspectors to examine the finished product and that about one hundred pieces, out of a lot, of defective porcelain were assembled. Since they have had blind men in those jobs there has not been any defective work going on. And since that he has discharged his inspectors.

These cases serve to show you the general method of attack. I have been speaking to you about trades that perhaps I am not well acquainted with. I haven't even been in the factories, and nobody in this job could know the range of industrial processes, and yet we want all that knowledge in order to give the best kind of a deal to the disabled man who comes before us for training, so we have developed a mechanism known as the Industrial Survey of Employment Opportunities for Handicapped Men. We study in succession industry after industry, listing the processes, examining each one to see what faculties it requires. Does a given process require one leg, two legs or no legs? Does it require one arm, two arms or no arms? Does it require sight? Does it require hearing? By studying processes in that way, we run across jobs in the most unexpected places which are distinctly advantageous for a disabled man of one kind or another. When all that material is put before us, we will find lots of jobs that any one person could never have heard of and in which men can satisfactorily be placed. That survey work is progressing now quite vigorously, being carried on by several organizations, and we are building up constantly more and more scientific data on which the re-educational decisions can be based.

To speak of the disabled soldier, because that is the person on whom the popular interest is now centered — the disabled soldier comes to the base hospital. Before the war ended, when a man was permanently disabled and his condition was clear to the physicians, or if his treatment would take over a given length of time, he was invalided home to the United States. They came in at Ellis Island, New York Harbor, Staten Island and Newport News, Virginia. At these clearing hospitals the cases were classified as well as may be. From there they were sent as near their homes as possible. There are sixteen reconstruction hospitals over the country. The disabled men are more content to stay in places near their homes where their families can come and see them. Then they are classified according to their disability. All blind cases have to go to No. 9 at Baltimore. Tuberculosis cases are largely sent to New Mexico and other points of similar location. The general orthopedic cases and other types of disability are distributed to any one of the reconstruction hospitals in different parts of the country. In these hospitals they have provided a rather elaborate system of education. They have learned that the old policy of letting a man lie in bed and look at the ceiling for six months isn't very good therapy and doesn't conduce to getting him well and cheerful, so they endeavor to keep him occupied. Some of these occupations have a distinctly therapeutic trend. For instance, a man with stiffened fingers is put to work on a typewriter, writing home to his girl, which does him a lot more good than massage.

Other parts of the training have a distinctive value. Let us presume a man comes in with a gunshot wound. That man does not need re-education. He has been reconstructed physically. He is a well man. But how has his time been put in while he has been in the hospital for six months under medical treatment? Let's suppose he has a little shoe shop at home. If he can have been taught during that six months a little simple course of accounting or bookkeeping, he would be much better off when he goes back into civilian life.

A good deal of the training takes on a vocational character and the hospital men are being trained in mechanical drafting, telegraphy and different trades too numerous to mention. Some of them are able to get along pretty well because their course of treatment is extensive.

The men who come up for medical discharge and have been carried as far as the hospital can carry them and are still permanently disabled are then committed to the Federal Board for Vocational Education. You were told about that earlier in the session.

The first necessity in dealing with a disabled man is to combat the natural discouragement. It is very hard for a man to be struck from the pink of health to a state of what he calls a hopeless cripple. Besides he has very bad precedents to base his expectations on. He knows that the man who was next to him in the factory was injured the same way three years ago. He knows how he was employed out of the kindness of the employer. We are under a little disadvantage in arguing with him because we simply have to admit our misdeeds in the past and say, "It was all wrong, but we are going to do better." You want to get with him real people of character and force and make friends with him and make him a constructive plan, or make with him a constructive plan for the future at the earliest possible moment. The next thing you want to do is to get him to decide to undertake re-education. Not all men want to away, he wants to get back home, he wants to get back to some kind of a job and he won't be bothered.

During the war period the great difficulty has been with the temporary job. Even a disabled man could get a job in a munitions factory at good wages and pass by the opportunity offered now. In England that has been a very serious question and the difficulty there is that so few men who need re-education have taken advantage of it.

Then we have to combat the idea of "Now I have done my bit; the Government should take care of me and I shouldn't do any more work for the rest of my life." That, of course, is simply a decision of character and that isn't encountered as often as one might expect.

After the man has decided to take re-education, it becomes necessary to pick out the trade in which he is to be trained. In the first place, he wants to find a trade which is growing, in which the labor demand is constantly increasing so we don't get him in a blind-alley. We must get a trade not too seasonal because the placement of a disabled man is more or less a special job and it wants to be done once carefully and not redone every three months. Then we want to find a trade which is teachable.

There was a question asked about arts and crafts. The artistic lines are not trainable with the average man. You may find one man in a thousand who has genius, but he would have discovered that genius probably before he went to war and would have gotten in that line already, but the average man cannot be taught to be a pianist or a designer, but he can be taught linotype operating or lathe work or something of that kind. So the trade must be teachable and not depend too much on native genius or talent. It must be teachable in a reasonable time. A disabled man may be able to stay away from home and work six months or nine, but he is not willing to stay away eighteen months. The trade of tailoring in France had to be abandoned because it took eighteen months to teach the men.

Finally, the man has to be placed in a job after the training is completed, and that is the least of anybody's troubles, because once you get a man completely trained in a given line, the placing of him is a simple matter indeed, providing it is done accurately, of course.

Before I talk to you any more about the principles of the work, I want to show you a series of slides which will rather illustrate what is being done abroad and to a small extent in this country already.

MOTION PICTURES

Mr. McMurtie here presented stereopticon slides and motion picture films illustrating the retraining of disabled soldiers in Europe, and the possibilities of artifical appliances as substitutes for natural limbs.

As I said before, one of the first impulses of the disabled man is discouragement, failure to believe there is anything ahead.

What I have told you about so far is what I might call the mechanics of re-education. In all the discussion which you have heard so far of this subject, we have been talking more of mechanics, of legislation, of Government provision, and we have been thinking less, I believe, of the social and human factors involved. Without the full assistance of the two human factors no system of re-education can be a success, and some of the work abroad is falling down because those two factors have not been enlisted on the right side.

The first factor is the spirit and determination and will power and ambition of the man himself. The second is the reaction of the community to the disabled man. I don't think we have much trouble with the former. As Mr. Little told you, the fellow usually starts out with good intentions and by unfortunate experiences one after another he gets discouraged and demoralized. The cripple starts right, and if we can give him a chance at the beginning before he has started on the downward road, we need have no fear of his own part.

On the other hand, the other factors are tremendously important, and I think in the past the community outside hasn't done the disabled man much but harm. The influence of family, of friends, of working associates, of employers, of the community in general have all been unfortunate and have all been adverse. That attitude must change, and unless the people as a whole realize the point of rehabilitation, realize the principle on which the Government and the authorities are working and receive the man in that same spirit, the system cannot be a success, and so it seems to me that public education is one of the essential features in any plan of rehabilitation. We must reach and get to understand all the different elements that I have mentioned. What is to be the attitude of the family? Is it to be that the disabled man should not work any more, that they want to take care of him for the rest of his life? On many occasions after a blind man is trained and sent back home, his family says, "Oh, no, you can't work; you can't go over there; you'll fall downstairs; you sit here in this comfortable chair and we will bring everything to you." In other words, the family practically reverses all the good influences.

In France they used to have a good deal of trouble with the mothers of the men. After the medical treatment had progressed to a certain extent or to a certain stage, Mother would sail in from the provinces and say, "Here, you can't keep my boy any longer; I have come to take him home." She would beat her umbrella on the table and insist, and there was nothing to do but let her take him away. She didn't realize what was in the future as between the two alternatives. Now they have a better way and when son is progressing so that his medical treatment is almost finished, they call Mother in and explain to her that he can soon go home. She knows, if she can think back, what happened to the disabled soldiers of the other wars. She knew just what became of them then. She might be told that her son would probably meet with some such similar end if he went away then in her care. Then they might say, "We have another suggestion to offer. Right here in conjunction with this hospital is a school of re-education. If you want and your son wants, we will retrain him for a new trade and he will go back into the community respected as a skilled artisan and all the more respected because he is making good in spite of his disability." The whole situation is changed. Mother goes into the hospital ward and says, "Son, have you heard what they are going to do for you?" That is the difference in having a family behind or against the program of re-education.

What do we want from the employer? Well, there are a whole lot of small technical things we might talk about. I can't resist the temptation to tell you a very funny story here. The librarian of the Red Cross institute is a very capable young women in perfect health and the only difficulty is that she only stands about so high. She has worked for me a long time now and has never missed a day. She was telling me the other day that she was employed a couple of years ago by one of the leading banks in New York City and after having passed all the requirements she was still to report to the surgeon of the bank for medical examination. After the examination she received a notice that she needn't come down to work, that she had failed to pass the medical examination, although the reason of the particular defect was not stated. She got very much upset and wondered if anything organic was wrong with her. After insisting upon being told the point on which she was turned down, she finally found that she was undersize and underweight; so, being physically handicapped by being undersize and underweight, although a very stocky, well-built person, she was turned down and not employed for a job I know she could have filled in a very distinguished manner.

Those are some of the technicalities and some of the rulings on which disabled men are excluded from jobs they could fill. The Civil Service Commission has made blanket rulings that they don't take men for certain types of work with certain types of disability, each in jobs where the disability couldn't have the remotest connection with the work they were to do.

Furthermore, we don't want the employers to react in the patriotic manner of taking care of men and putting them in soft and easy jobs,— jobs where the man knows he is being pauperized and there is no future for him. We want the disabled man to earn one hundred cents on the dollar. On the other hand, the disabled man, when he is properly placed and in a job he can fill, is a very desirable employee. Most of them have had pretty rough experiences getting employment and when you can find a job they can do, you will find their loyalty and thoughtfulness is well above the average and will make up for 95 per cent of the deficiency. The community at large, it seems to me, has a particularly responsibility in this field. Everywhere that the disabled man comes in contact with the public he is injured almost beyond repair. A railway surgeon of one of the western roads told me years ago that, before we talked scientifically about provision for disabled men, if he could get a man the day he came out of the hospital, he could make a success out of him, but if he let him get away from him for even three weeks to go back home and have all the public influence working on him, that man would be a failure, and that is about the case.

The lady who operates the Canadian Patriotic Fund also told me a long while ago about a disabled soldier who came home from the front. He had been away for a couple of years in France and the family had, of course, been looking forward to his home-coming, but when he arrived they didn't see much of him. A holiday was approaching and finally the Mother got a half-hearted promise from him that he would take her and the children to the park on this holiday. The morning of the day came and Father showed no signs of life. Finally Mother said, "Aren't you going to take me and the kids to the park?" He said, "No, I've got to go down to the Ritz for a sing-song affair this morning and for a ride in the park this afternoon." The ladies of Montreal were caring for the returned hero, and so it is in the vicinity of practically every hospital at which disabled men are being taken care of.

I can't understand yet the colossal injury that was done some of our own disabled soldiers in letting them out of reconstruction hospitals for the Liberty Loan campaign. They did just the thing that all the re-education people are trying to remove.

A Canadian soldier came into our Institute a while ago with both arms off and he came to our Employment Secretary and began talking about getting some work. We asked him what he had done in the past. He said he was a window cleaning contractor and had a business of his own and employed other men to clean the windows. We said, "That is bully! you can go back to that and won't be handicapped at all." He said, "Oh, but window cleaning doesn't interest me any more." He had been working for the Liberty Loan Committee. He said, "What I want is a propaganda job." And so it goes. They are being spoiled in that direction. It is going to be some time before that man comes down with a thud at the bottom and starts to do something constructively.

In a New England city the early reports of the returned soldiers were that nobody could tell whether the men were suffering from shell shock or intoxication, so great was the hospitality of the male members of the community.

Success in rehabilitation, after all, is a conquest of the spirit. It is a matter of character. If we can solve the character question and get the will and spirit of the men right, we are on the right road. The social worker, it seems to me, because after all the social worker is one of the character building agents in the community, has a very real part in rehabilitation because each man is a character case that must be fixed upon the right side before we can do much with him industrially or economically.

I wonder if I can give you, in closing, an instance of what the power of the spirit is for the disabled men when it goes in the right direction. Nobody can help a cripple as much as another cripple, and we have put that dictum into practical application in what we call cripple parties which we have from time to time at the Red Cross Institute. We have some of the most difficult cripple cases on our books that you can imagine, people who have been practically out on the streets for years and have seen no future and they are discouraged, they are shot to pieces and they don't believe there is anything left for them in life. We get those men together every once in a while and get with them at the same time another cripple group of fellows who have made good. I remember one meeting which I shall never forget because we had assembled there talent of the most unusual character, disabled men who had made distinguished successes. The first man to speak on that evening was a fellow who had been injured in a railway accident and had lost both arms. This man had one arm practically torn out of the shoulder and part of the collar bone was gone. The other arm was amputated just below the elbow. He was turned out of the hospital to make his own plans for the future. In trying to keep breath within his body he had to go from house to house to get enough food, but meanwhile, he never gave up and he was always looking for a job. He tells me that he probably called on 2,000 employers looking for a job and the reaction was always the same — a sympathetic smile, a statement "There are no jobs available today" and the offer of a half dollar — always the half dollar, he said, but never the job. Now, how many men would stand up against that process for long? They would find that they could collect $40 in a week by that kind of work and that they couldn't make $20 in any other field. However, it didn't affect him and he resolved that he was going to make good in spite of it all.

He finally went to a friend of his father who was a contractor and he said, "I am not going to ask you for a job, because you laugh at me, but I am going to ask you to let me try at some of your work. Don't put me on the pay-roll, and see if I can make good." The man said, "All right, go ahead." He did as well and better than a man with two hands and was taken on the pay-roll. He used his evenings while he was working studying law. He was later admitted to the bar, and not being content with that he decided to run for public office. He ran for the office of Justice of the Peace and was elected. During that time he was perfecting his own kind of artificial arm appliance — not arms, because they had no relation to arms, he made special devices to do certain things. The only way to insult him is to do something for him. Then he ran for County Judge. Quentine P. Corley has now been re-elected three times County Judge of the County of Dallas, Texas.

The other speaker on that evening was a man who had been caught out in a blizzard and overcome by the cold. When he was found he was unconscious. When he came to they had amputated two legs, one arm and four fingers off the other hand. He was absolutely destitute and turned over to the custody of the county supervisors of the poor. For two years he was practically in the state of a poorhouse inmate, but he didn't lose his nerve. At the end of the two years he said he realized that what was not handicapped was above his neck and he would have to polish up the machinery in his head. He went to the county supervisors and said, "Here, I am healthy. If you leave me here, I,ll live on you until I am ninety, but if you will give me one year in college, I'll never cost the county another cent. The supervisors sat up until three o'clock in the morning deliberating the case and "Thank God!" he said, "There were two sports in the bunch." Michael Dowling has since been speaker of the House of Representatives in Minnesota and he is the leading banker in that state.

All of our crippled friends tell us that the handicap of loss of limbs is nothing compared to the handicap of public opinion.

CHAIRMAN ANDREWS: If any of you wish to ask Mr. McMurtrie specific questions at this time, the opportunity will be given you for a few minutes.

This problem that he has been telling us about so interestingly is to my mind really an industrial problem, and the military part of the question is merely temporary. The schools are being organized and the corps of instructors is being gathered together. During the next four months Congress and the state legislatures will realize the necessity of putting the whole thing on a permanent basis to take care of the permanent problems.

If you have no questions to ask Mr. McMurtrie, we will bring this meeting to adjournment.

THURSDAY MORNING, DECEMBER 5

PRESIDING OFFICER: DR. LEONARD W. HATCH, CHIEF STATISTICIAN, NEW YORK INDUSTRIAL COMMISSION

DR. HATCH: Ladies and Gentlemen: Perhaps I may introduce the general subject of this session most appropriately by giving you a bit of history which lies back of it.

Some time ago we were impressed by the number of inquiries which were coming to the Industrial Commission for information relating to shop safety organization. We found that there was a good deal of interest in the subject in the state and naturally so, as I think you can all understand, but there was a great deal of lack of knowledge of how to go about such organization and just how to carry it out after it was started. It seemed well worth while to undertake in the Industrial Commission, if possible, to bring together some information which might be helpful to employers who were interested in undertaking something along this line, which in a way represents the highest development of the safety movement.

The Bureau of Statistics has a title which in full is Bureau of Statistics and Information. I don't know whether information is supposed to be something different from statistics or whether statistics are not supposed to be information, or not. However, we have that title and accordingly the Bureau of Statistics and Information tried to bring together something with reference to shop safety organization. Our information should be as practical as possible. We started out with the idea that we would get whatever could be gotten from the literature of the subject, but especially we wanted to bring together practical experience from firms in New York State which had had some experience in this kind of work. Accordingly we got that kind of information. Then it seemed to be the most practical thing to do to put this information in the form of an outline plan for shop safety organization as a suggestion, as a starting point, for any firm which might be interested to know concretely about such organization.

The result was a drafting of a plan of shop safety organization, and then in order to keep the whole matter on the ground as much as possible, we submitted that to every one whom we could think of, both in this state and elsewhere,— employers, employees, safety men connected with various interests, public officials, and private persons interested, for criticism and suggestions.

After having received a most gratifying amount of co-operation of that kind and assistance without which we could hardly have done what we have done, we then took the matter before the Industrial Council, the State Industrial Council, which is the advisory board to the State Industrial Commission, and the plan was there discussed, some points being discussed quite fully. The Council passed a resolution approving the idea of the issuance of such a suggested plan by the Commission and approving the idea of proceeding with further revision and development of the plan. Accordingly the plan was revised and has been printed as a second draft and copies have been brought here this morning.

There is something significant in calling this a second draft. We recognized that the first draft was a long way from being the last word and we also indicate that there may also be an unending series of drafts coming afterwards. The point of that is that this thing is a developing subject. Shop safety organization is a growing matter and unquestionably, as experiences develop, new ideas, new improvements and possibly the dropping of some present features will come about. The Industrial Commission hopes to secure the benefit of experience in the State of New York by from time to time inquiring and investigating to find out what practical experience is teaching along this line and so to keep this plan which the Commission hopes to make very helpful in the way of suggestion to employers up to date as we go along. Take the copies of the plan here this morning. If you want more copies write to the Commission at Albany and we shall be glad to furnish as many copies as can be usefully employed anywhere. We want you to take them — not to advertise us but in the hope that these plans will be helpful to you. In other words, if you can get something out of this, by all means take it and use it, but do more than that. If you have had something in your experience which bears on some point covered in this plan, something which seems to indicate to you something different from what is incorporated in the plan and you have found by experience that that something different works better than what may be here incorporated or if you can suggest additions, notify us of it. In other words, give us any kind of suggestion or criticism that you can so that we may make this the best plan in the State of New York, if possible. What we want to give you is a kind of composite of the best experience which has been developed in the State of New York or anywhere else for that matter, but New York is the particular field of the Industrial Commission, and we want to have it always available so that any employer interested in taking this step of safety organization will have some kind of a guide, at least, to start with and from which he may work out adaptations fitted to his particular conditions and needs.

I have gone a little bit aside from the main topic this morning, which is the program before you, but that, as you see, is closely related to the plan which the Commission has been working out and it is closely related not only because the subjects happen to be along the same line but because we are very fortunate in being able to call upon four men who, among a great many others, have been very helpful to us in the way of criticism and suggestions for proper formulation of such a plan.

In the program this morning we have planned to have the four speakers who are on the program speak first and postpone the discussion until all the papers have been presented. Then we will have discussion on all of them together because, as you see, some are closely related subjects.

The first speaker is Mr. Chester C. Rausch, Assistant Director of the American Museum of Safety, who will speak on "The Safety Supervisor — By Whom Should He Be Chosen; To Whom Should He Be Responsible; What Authority Should He Have?"

THE SAFETY SUPERVISOR — BY WHOM SHOULD HE BE CHOSEN; TO WHOM SHOULD HE BE RESPONSIBLE; WHAT AUTHORITY SHOULD HE HAVE?

By Chester C. Rausch, Assistant Director, American Museum of Safety, New York City

Mr. Chairman, Members of the Congress: Somebody has said that one of the greatest needs of America at the present time is a goat — some one on whom various things that they would like to be rid of can be placed. When the original program was suggested to me, I agreed to help, but I was somewhat surprised to find that I had been given the subject assigned to me this morning. I expected to take only a very small portion of the discussion from the floor, so that in discussing the safety engineer from the various angles just mentioned and considering that in line with remarks I made the other morning concerning the maintenance and repair of men, I find myself acting first on one side and then on the other, so if I stray from my subject, you will be able to see the reason. In comparing the two ideas and attempting to keep them separate, there is some overlapping.

I am in the predicament of the man who was just married and told his wife that never should she come near him, or come to the door of the bathroom when he was shaving, that a slight slip of the razor might cut him. One morning when he was shaving she forgot and came to the door and called him. The razor slipped and cut off a considerable portion of the end of his nose. The sight of the blood frightened him to such an extent that he dropped his razor and it removed the end of his great toe. He saw the two pieces lying there and they looked so much alike that he picked them up, put one on the end of his nose and the other on the end of his toe. He sent for a doctor who succeeded in putting them on successfully, but now every time he wants to blow his nose he has to take off his shoe and every time he stumps his toe he sneezes.

I want to tell you that I am going to say something very frankly to inspectors, safety engineers, supervisors, master mechanics, etc., and I want you to get my idea. I am simply voicing the result of conversations I have had with a number of men, and observations I have been able to make, over a considerable period, of men who are doing work in safety under any one of those heads, and indicating a confusion that is apt to arise and to cause difficulty, not only with employers but with those men who may be employed, whose qualifications are not understood by the employer who hires them and who may not fully understand the work into which they are going. It very often brings about embarrassing situations for both parties, and if I can sound a slight note of warning that will cause some men perhaps to hesitate a moment before plunging into that sort of a situation, I shall be glad because I will have given you something of the experience of employers I have met, men who have been through our office and through other agencies I know of who have been looking for work of that sort. It will indicate the nature of the confusion that arises in their minds.

A supervisor, an inspector, a master mechanic and a safety engineer are very different creatures. There is probably no word in this country that is any more misused than the word engineer. We have locomotive engineers, mechanical engineers, electrical engineers, efficiency engineers, everything that comes under the head of a particular thought or type of work requires evidently some sort of an engineer to run it. In England there is a distinction between the man who runs the engine and is called an operator, and the man who designs that engine and brings together properly the forces of nature which make the machine possible.

There is growing in the field of safety the need for safety engineers, men whose training, whose natural aptitude and whose experience fits them not only to take care of the routine and the run of work which comes every day, but who are fitted by that training and experience and natural aptitude to investigate in a scientific way those things which ordinarily escape the attention of a superficial observer.

You will observe in a few moments the trend my thought will take. I believe that a description of a safety engineer might well come first, then of the supervisor. A safety engineer should first of all have a fundamental education in mechanics, in chemistry and in physics. Those three things will give him an understanding of the laws of nature which will make the problems which he meets clear. There is a great difference between providing guards for a machine and specifying the nature of the material that should go into that guard. A good practical man can suggest from his experience in operating a machine or working about an engine the shape that the guard should take, and his common sense and that of the man working with him as an engineer will indicate the amount of protection necessary. That is the combined thought of the two, but when a discussion may arise as to the strength necessary to maintain a 48-inch bolt moving at high velocity, or 48 or 60 odd ropes in a heavy rope drive in order that in case one breaks, or the entire lot should break, they will not do damage, that is distinctly a problem that calls for more than the education of a practical man. The technical man may discover many ways to do that without involving the expense or amount of material that a practical man would use in order that he would feel safe. That would be an unfortunate illustration, but it shows the measure of care that would be used in certain types of protection.

On the other hand, it is perfectly feasible for a practical man to make sure that fuses are supplied in an electrical circuit and that they are maintained in good shape, but the question of the type of compensator that may be necessary for a particular motor, the sort of switchboard protection that should be used, is essentially an engineering problem that requires careful thought, study and determination in order to get the proper, least expensive and most satisfactory material.

I say that an engineer should be trained fundamentally and he should be able to use that training in a plain, common sense, matter of fact way.

To illustrate: The same wind that flaps your curtain and annoys you in the morning while you are trying to sleep is the same wind that later in the day may tear off a large door from its hinges, or rip off the roof of a house, cave in the side of a temporary shed or still later in the day, when it has obtained more violence, tip over some locomotive or do other damage.

In other words, the man must recognize that in the wind which he hears and sees he has a fundamental force. He must recognize also that expansion and contraction in a thermometer, in a steel girder or in eighteen or twenty feet of steel pipe, or in whatever place expansion or contraction takes place, is the same, and he must know the laws which govern that expansion and contraction. It is just as necessary to provide expansion for protection for the gooseneck of the nozzle of a boiler as to provide expansion for protection for the same pipe when it runs 2,000 feet to supply an engine. The maintenance of the cover on that boiler, the protection of that steel pipe by covering, and the maintenance of the covering in good shape and the use of that steam in the engine may be easily done by a good practical man. I want to say here that I have learned more from good practical men, old and young, particularly the old men, than I have from any amount of reading or superficial observation that I have made myself. One of the most instructive things that an engineer or supervisor can do is to discuss problems with other men, get their view-point and then from his own experience see why their experience was different from his and in what way he can improve. We never learn except by experience. We may read a considerable amount concerning a problem and appreciate a large amount of the hazards involved, but the final conception of that hazard and the problem and what should be done to eliminate the hazard is a thing we must experience either through our own eyes or those of others. So I say the practical man, the maintenance man, the master mechanic, the foreman, the superintendent, any of those men who have been through it and know the problems, are the men who can help us.

I would not say that a man of that type who started in the shop and worked up could not become a good engineer. Some of the finest engineers we have ever had have been men who have trained themselves, but they have used their power of observation with the experience of others, and crystallized in their own minds the fundamentals which are necessary for their particular field, so in safety engineering there is just as much opportunity for the practical man as for the technically trained man, but the practical man, if he comes up through the ranks, should take every step possible to secure a broad, fundamental training as to those three things — physics, chemistry and mechanics, the laws of nature, because after all those are the things which guide and control every process, every act that we carry out throughout the day. It makes no difference from what angle you look at your existence, whether it is your sleeping, your eating, your traveling about or your operation in the shop, some one of the laws of nature govern your moods, and a clear, concise conception of those laws and your ability to recognize them in whatever form they occur will give you the fundamentals in physics, chemistry and mechanics.

The man must have an aptitude for the work. A safety engineer is really more than an engineer. To him are brought troubles concerning ventilation, heating, lighting, toilet facilities, restaurant and rest-room problems. He is a sort of intermediary between the manager and the shop foreman and superintendents and the workmen themselves. He is presumed to consider the physical well being of the human body in the shop from the time it gets there until it leaves. He is a sort of clearing house for the problems that arise concerning the comfort, safety and health of the men in the shop. Primarily, that is the duty of the safety engineer.

During the war a number of men have sprung up who have presumed to use the title "Safety Engineer" who, in the last analysis, are practically not equipped for that sort of work. I say that on this authority: That within six weeks it was my privilege to grade for the Civil Service Commission nearly fifty papers of applicants for the position of safety engineer in various government places, and of that number I selected twelve who finally showed they had any qualifications either of education or experience that would permit them to come under the head of "Safety Engineer," and of that dozen I selected, and others have agreed with my judgment, only four who might really be considered as suitable candidates for the positions they sought. There were all types of men applying, men of all kinds of experiences, some along transportation, some along shop, some along teaching, some along insurance, but fundamentally they all lacked some one thing that made their training not adequate for the work.

I was reminded of a story that is told of Professor Agassiz, probably one of the best naturalists the world has ever known, who for many years was connected with Harvard and who in his broad experience came to a point where it was said that if any portion of a bug was brough to him, he could tell the nature, the habitat and all the conditions of living of that particular insect. It was also a fact that the old professor was near sighted. He had a class one time which had become quite familiar with him through long study and in the class was a wag who suggested this little stunt: That they get a spider, remove the legs and head and to the body attach the legs of a grasshopper, the wings of a fly, the head of an ant and doll it up and make it quite a respectable looking thing. They mounted it on a specimen pin, took it in one morning and asked the Professor if he could tell them what sort of a bug that was. He looked it over carefully and very quietly replied that he thought it was a humbug.

I am afraid that judgment would have to apply in some cases to those who seek to do safety engineering work who are not physically, temperamentally, or educationally fitted or trained to do it.

To those employers who undertake to establish a good grade of safety engineering in their works I would say this: Select your men with care, and you will note that I have answered one of the questions — by whom should he be chosen? The safety engineer's work is so fundamental and concerns every portion of the work to such an extent that he should come directly under the manager or head of the concern. His work should be a department by itself, whether it consists of the safety engineer alone or of himself and a corps of assistants. That man cannot use good judgment, unbiased judgment, and be fair in his recommendations both for change of personnel, possibly of conditions, and those things in the organization that are to come about later, unless he is free to exercise a judgment unbiased by the thought that the men under whom he comes have carried back or used to disadvantage some of his recommendations or performances. He should have authority to make recommendations in every part of the plant. He is presumed to be a man able to observe much that escapes the attention of other people. It is his particular function to be acute in observation, perhaps to a point where he may be called finicky or fussy, but very often the detection of a little thing by a fussy fellow, or the exercise of a finicky judgment in a point that would ordinarily be passed up is the very means whereby there is discovered the thing that needs remedy.

The Cambridge Water Department some years ago found that the pond in which they stored the bulk of their water was covered by a growth of algae and other material of that sort that was becoming offensive and destructive. The question of removing it was brought up. It would have been possible to put in drags and tugs and go to an enormous expense to remove that growth. It was practically removed by the very simple expedient of taking twenty-five pounds of copper sulphate and a couple of men in a row-boat who, for a few days, dragged that stuff around about the pond.

It is conceivable that a situation might arise in a manufacturing plant where labor, material, equipment and expense would be used to an enormous extent to overcome a difficulty or make safe some peculiar condition, yet a very simple suggestion from a competent safety engineer who has made a specialty of knowing the necessary things to do and of observing the places where they can be used might prevent an enormous amount of work and expense. So I say a manager is the man to select that type of workman, that type of employee, and he is the man to whom he should be responsible, for the problems that come up are such that they require considerable expense sometimes, otherwise expensive because they require labor and material, and they require the decision of the executives of the organization. That can be the work for a man who is technically trained, for the man whose experience and practical knowledge will make that thing practical.

Inspectors learn much in traveling about, but they should in the meantime use every opportunity to reinforce their experience by studying the things they meet from the angles of nature's laws, and knowing the reason and thereby being able to detect, as they go about, the very place where they can use what they have absorbed.

I have cited a number of instances. I don't know that it is necessary to go much further. Possibly the copper sulphate illustration will be sufficient, but it is a question as to what authority the engineer should have and to whom he should be responsible. The supervisor or inspector, or whatever you choose to call him, is another problem, but he should be directly responsible to the safety engineer in order that he, too, may be free from any influence that may be brought to bear if he is put under a shop superintendent or foreman.

It is a human trap impossible to escape that when you are under a man whose work you must criticise, your judgment, your decision, no matter how carefully you may be inclined to form them, will cause ill feeling. The recommendations that the inspectors make should be passed on by the engineer and should always be taken if there is any good in them.

The organization for a plant of 50,000 is a vastly different thing, particularly if it be spread over a number of plants or buildings, from that of a little workshop or a garage where only a dozen or a hundred men are employed. Adapt your man to the problem you have in hand.

I have here perhaps a half dozen things that I have put down in the way of illustrations both for the practical man and the technical man where both had failed and where both had succeeded, but possibly I have covered the point sufficiently so that it will not be necessary to give those. One illustration I might use comes to my mind — why the safety engineer should be technical, why he should continue to be technical in his study and why he should grow along those lines as well as practical lines. The man who discovered cornstarch discovered it by accident. He conceived that corn could be made into flour or starch. Just how, he didn't know, and he set about experimenting with jar after jar of corn with various chemicals in it and it had failed repeatedly. One day his wife in disgust gathered up the whole mess of corruption and threw it into the garbage pail. That night she asked him to empty the garbage pail, and that night he found the garbage pail full of cornstarch. Then he had only to remember the things he had used which might create cornstarch. His wife had unintentionally done him a good turn, not a scientific turn, however.

Edison spent eighteen months trying to make his phonograph say "special." It would say "pecial" with all the alacrity any one could wish but the "sp" combination would not come. Edison tried every device, one after another, to make that machine say "special." By studying the situation, he was able to make his phonograph do what every other phonograph up to that time had not done.

When he wanted to get a filament for a carbon lamp, I am told, he tried over eighteen hundred different materials. By observation he was able to pick out and find the one thing that would do the trick.

The safety engineer must ever be on the alert and study his subject with the idea of finding the thing that is unusual, possibly not evident on the surface and requires thought, study, consultation, etc., in order to get behind the trouble and bring out a solution that will eradicate it. So we sum it up simply like this: That your safety engineer should be either technically trained or acquire that training as soon as possible. He should have a liking for the work and be willing to get out and mix with his men, hear their troubles, solve their problems, work with them, bring back a solution and carry it out. He should, in the final analysis, be a man who can do that and enjoy it. That type of man, I believe, in the next few years is the type of man who is going to mean much not only to the manager of men but to the situation that is arising now where men seek to meet their employers and their employer seeks to meet them through a common understanding. The safety engineer has a function there because through his efforts the movement of the machinery is made smooth, facile, and brought about with the least friction either to the employer or the workman. If he can perform that function as a part of his regular work, and perhaps only the secondary part, he has done double work.

I say there is an opportunity for any straightforward, clear-thinking, energetic man who is interested in his work, believes he can do good to his men and wants to do good in the safety field. If he has that foundation, I believe the words "safety engineer" will come to mean much in the industry of this state and this nation.

DR. HATCH: The second speaker who will continue the discussion of the subject of the safety supervisor, is Mr. H. C. Wiberg, Chief Inspector of the Compensation Inspection Rating Board.

THE SAFETY SUPERVISOR — HOW SHOULD HE BE CHOSEN?

BY H. G. WIBERG, CHIEF INSPECTOR, COMPENSATION INSPECTION RATING BOARD, NEW YORK CITY

Mr. Chairman, Members of the Congress: I don't know but what I ought to appear before you with a little diffidence in view of the fact that I am connected with the Compensation Inspection Rating Board. I suppose all of the employers here have had some little experience with the Board or with their inspectors, and very often have felt that they possibly have not been treated exactly right. I hope that there are not many who have felt that way because it has been the intention of the Rating Board always to give out absolutely and impartially the justice it felt was due. You may, perhaps, realize the difficulty in trying to classify, that is, assign and bring together plants of similar character in view of the fact that there is some difference in every plant from any other plant in the same line, but those differences and those exceptions are being ironed out as time goes on to the entire satisfaction, I think, of every one.

When our estimable Chairman called on me for a talk on some phase of the safety inspector problem, that vital feature of any campaign or organization to prevent accidents, it was quite natural that I should think of the considerations which should govern his selection. This was because of the apparent lack of realization of his importance in such an organization on the part of those called on to appoint the safety inspector.

With your permission, I will explain in a few words one of the functions of the Compensation Inspection Rating Board with which organization I have the honor to be connected. We make inspections of manufacturing establishments for the purpose of noting the physical conditions and the morale, the inspection being made in accordance with a schedule of standards for guarding or removing hazardous features. There is a system of penalties and credits for different items in this schedule according to whether the condition is below or above the normal or average for plants in general. The safety organization with its committees, safety inspector, and educational propaganda, such as safety bulletins, safety literature and meetings for the discussion of safety questions, is one of these items and has a large effect upon the rating of plants. It, therefore, receives much attention and thought in our office. Our inspectors obtain detailed information on this point.

As head of the inspection department, the reports containing this detailed information come to my desk. They are carefully examined and full, partial or no credit allowed, depending on the measure of effectiveness as shown by the records and results in the plant. Several thousand are considered each year. It is because of this contact with the question and several years of field work that I chose as my subject, "How to Choose the Safety Inspector."

The safety inspector is the main spring of the safety organization. In fact, he may, without exaggeration, be said to be the life and soul of such efforts. He gets in touch with every employee. His personality has much to do with its success. His keenness and alertness will usually be found to be a measure of the effectiveness of the organization. His propaganda will get into direct contact with even the least important employee in the shop. It is his duty to demonstrate and explain to new employees the hazards which they will be exposed to and how to prevent accidents from them, or must arrange for such explanations by foremen. He will be a familiar sight because of his inspection work and the success of the organization will be largely affected by the seriousness and enthusiasm he brings into his inspection work.

If we consider the inspection work further, its importance will be still more realized. It will familiarize him with every nook and cranny in the plant. Nothing should be too small for him to note and correct. There will be conditions in out of the way places, or of relatively small exposure to accident which will be overlooked by the committees on their more infrequent and consequently less detailed inspections. The safety inspector who is up to his job will not miss them. Some of them, such as a single set screw, or defective ladder, may cause a serious injury.

One further thought with respect to this work which is illuminating as to its value. All inspection rating schedules require regular, conscientious and effective inspections before any material credit is allowed for safety organization activities. An organization without such inspection work receives very little consideration. It is felt, and I think you will agree properly so, that without such a medium for regularly and accurately pointing out defects and lack of proper safeguards and practices, very little benefit can accrue.

With these considerations in mind, we come to the method of filling this keystone position. This logically divides itself into two lines of procedure, depending on the size of the plant. This determines whether the inspector is to devote all his time to the work, or only a part. This is also influenced somewhat by the type of plant. But it is a fact that large plants, even in those industries where there is usually very little mechanical or structural hazard, do develop material hazards of that nature as they, by virtue of their size, acquire large buildings with the attendant structural hazards, generate their own power, carry on their own maintenance work and include all processes required in the manufacture of their product or products. Consequently, the differences due to type diminish as the plants become larger.

We will first consider those plants where the size is deemed sufficient to warrant the entire time of the safety inspector. These have usually been judged as plants with 1,000 or more employees. The question which immediately confronts us is, "Is a plant employee to be appointed or a man — an outsider, if you will — who has been trained in safety work? With all due respect to those plant employees who have been so promoted and made good, I feel that in such plants he should unquestionably be one who has been trained in safety work.

If you have work requiring the compilation of statistics, you naturally look for a statistician. If you have chemical analysis or research work to be done, you, of course, look for a trained chemist. With safety work to be done, and who is there to dispute its value and importance, a trained safety man, a safety engineer, is the logical choice. Safety engineering is a profession — a science, if you please. Technical schools are offering courses evidencing its importance and recognition.

Consider the manner in which the Government attacked its problem in this matter. Its value was realized early in the enormous expansion due to war activities. Men were wanted to take charge of the safety work in the arsenals, the navy yards, the shipyards and factories under Government supervision. What was done? Trained men from the insurance companies, from the rating bureaus, and from plants where such work had been carried on were secured and the results were most gratifying.

It may be pointed out that a plant employee has the advantage of being familiar with the plant and the employees. It seems to me that that is more often a disadvantage than an advantage. This very familiarity might, and does, lead to disregard of hazards because of harmless exposure to them for a long time, it affects the prestige of the position in the general body of employees and consequent disregard of safe practices instituted develops.

On the other hand, the appointment of a trained safety man will bring a definite plan of action, resulting in the elimination of hazards in the order of their importance, will bring a fresh viewpoint to bear and will demonstrate to the employees the importance attached to the work by the management of the use of guards and observance of safe practices.

Aside from the question of previous training, the following considerations should have weight:

Personality is important. The safety inspector should be forceful and energetic without being overbearing. It is imperative that he make friends with, not antagonize, employees or the committees with which hearty co-operation will be necessary for success.

He must have the ability to reason logically and make clear and simple explanations. This is indispensable in laying down safety rules, safe practices and acquainting new employees with the hazards of their work.

He must be enthusiastic about safety work, its methods and results. Without this it is a question whether the safety message can be driven home. Only absolute conviction and confidence can interest and enthuse the indifferent and skeptical. Cold and half-hearted utterances will not attract lasting and continued attention.

Even after the interest is aroused it must be continually stimulated. There must be new methods of attack to keep the spirit of the organization from lagging. Therefore, initiative and alertness are qualities essential for a successful safety inspector.

Now, let us consider the small plant where the safety inspector can only give part of his time. Here the choice is, if anything, more difficult than in the case of the large plant. There trained men are available and their fitness and ability known. Here, however, choice is confined to the material in the employee personnel of the plant without safety training and must, therefore, be in the nature of an experiment. It may be necessary to try several men in order to get a suitable man. This should by all means be done if necessary.

It is very easy to jeopardize the success of the entire organization by considering the appointment a matter of form or because of insufficient thought and consideration of qualifications.

Let me say here that mechanical work should not be the only criterion. There are two reasons, one being that it will be necessary to educate and train your choice in the principles of accident prevention and he must, therefore, show ability to absorb instruction. The other is the fact that there are many important hazards which are not mechanical in nature and on that account he must not be limited wholly to the horizon of mechanical conditions.

I think it is largely due to the fact that this has been the predominating, if not the only qualification, thought of in choosing, that we find so many small plant organizations purely and simply a matter of form. This has unquestionably been done with the best intentions, but the results have been sad to behold. You have undoubtedly heard before, and possibly at this very meeting, that the man who is in daily contact with dangerous conditions does not so consider them, but it nevertheless bears repetition. Add to this the fact that these men when made safety inspectors do not have put in their hands any literature or systematic instruction in accident prevention, and it is easily seen why the inspection work becomes a matter of form only and consequently a failure.

Let me, therefore, urge first that the choice of the safety inspector in small plants be made the personal business of the employer. Do not relegate it to any one else. Second, that he be picked only after a careful appraisal of his fitness. You should choose one who is familiar with mechanical conditions and appliances, but whose knowledge is not entirely limited to them, who is active, alert and interested in his work and, therefore, can be interested and can enthuse about safety work, who is energetic and forceful but who at the same time is congenial and does not antagonize, who can explain clearly and simply and finally, one who can and will absorb by contact with trained safety men, and study the principles of accident prevention.

I cannot close without adding a word about the safety organization plan being published by the State Industrial Commission under the direction of our Chairman. In listing and bringing to general attention the books and pamphlets dealing with systematic accident prevention, valuable information will be put into the hands of safety inspectors. This cannot but be of great assistance to them and thus to the whole safety movement. It is a most commendable step and one which is welcomed by the rating board and the insurance companies.

DR. HATCH: Thus far we have been considering the safety inspector. One of the fundamental principles of shop safety organization is the enlistment of the interest and co-operation of all concerned. Co-operation is the basic principle of the whole undertaking. That means the co-operation of all the employees in the plant, particularly and especially, because they are concerned in more ways than one. They are concerned with the result, and unfortunately, they are the only ones concerned with the result of failure to achieve safety in a plant. On the other hand, as we all know, they have a large part in achieving that safety.

One of the difficulties which is frequently encountered in undertaking any organization of an industrial plant with a view to co-operation of all concerned is the presence of non-English speaking workmen. We are all coming to recognize that in various relations. Hence, in considering a plan for shop safety organization, the problem of non-English speaking organization is also of considerable importance.

For that reason we are glad to have as the next speaker Mr. L. P. Worthington, Engineer of the New York and New England Cement and Lime Company, who has had some experience with shop safety organization where a considerable number of the employees are non-English speaking workmen. Mr. Worthington.

THE NON-ENGLISH SPEAKING WORKMAN IN SHOP SAFETY ORGANIZATION

By L. P. WORTHINGTON, ENGINEER, NEW YORK AND NEW ENGLAND LIME AND CEMENT CO., HUDSON

Mr. Chairman, Members of the Congress: Sometime ago I was asked to tell the Congress how to make workmen's committees successful among non-English speaking workmen based upon experience. I was not confined to this specific topic, but was given greater latitude. With reference to the paper in hand, I wish to say that I have gratefully taken advantage of this greater latitude for the very good reason that we have not made foreign workmen's committees successful, and I have, therefore, selected a more comprehensive topic which yet affords the opportunity for presenting briefly what I consider to be the salient features of the problem. I think the members of the Congress may realize the scope of this subject, and I have consequently given to it a limited treatment, preferring to have the paper act as a sort of entering wedge to informal discussion of this chapter of safety education.

The foreign workman is usually not so alert mentally as his fellow American workman. He thinks slowly and acts impulsively. He is of unusually strong sentiments, however, and at present, it is to this attribute of his nature that we are obliged to make our appeal to secure his co-operation in the shop safety organization.

I have yet to find one man among the non-English speaking workmen who has failed to show a real desire and willingness to be of help in the work of accident prevention, if he can be convinced that the primary purpose of a safety organization is to reduce and prevent suffering and to save lives and limbs.

Generally, the kind of work they do carries them into the places of greatest hazard, and where the working conditions are those in which greater care, caution and safe thinking are necessary. In many of our larger industries these men are doing a class of work which requires special effort and attention for the prevention of accidents, and safety organizations in effect where this class of workmen is employed cannot hope to show great results until these men have been won over to active committee service.

Last year in the industries of the Portland Cement Association, in this country, fifty per cent of the men employed were foreigners. Thirty per cent of the men employed were composed of Austrians, Slavs, Italians, Hungarians, Mexicans and Poles. This thirty per cent forms the major portion of the non-English speaking accidents. Inversely, the balance of the foreign employees, or twenty per cent who speak good English, carried only ten per cent of all accidents. Without going into detailed statistics, it can be safely stated that studies reveal the severity rate to be higher among the non-English speaking workmen.

There are many places formerly occupied by American workmen that are now filled by foreigners. Some of our soldiers are coming back physically incapacitated to fill these positions. There will be others, also, whose outdoor life and training will tend to draw them away from indoor industrial pursuits. In any event, however, we can conclude that our shop safety organizations have to deal with a reasonably permanent problem.

The general education of this class of workmen is very limited. He has little vision outside of his own small circle. He brings with him to the country of his adoption ideals and standards of living far below those of his fellow American workmen, and these factors must be given due consideration in securing his co-operation in committee work.

One serious handicap to the successful operation of foreign workmen's committees has been racial feeling, a hostile attitude among those workmen whose respective mother countries have been at war. This opposition has been of a silent, unobtrusive character, but nevertheless evident, and it does not promote team work in the plan for a safe shop organization.

Unification of language is the first essential — a big undertaking, it is true, but call to your mind a foreign workmen's committee where the members speak one or two or from three to ten different languages and dialects, and it can readily be seen that such a gathering is not headed for a very brilliant place as an active factor of a successful safety organization.

Neither is it in harmony with the spirit of the times, nor do I believe it to be practicable to attempt to educate this class of workmen to the purpose of the industrial safety movement by conforming to their number and variety of languages, and by printing rules, warnings, safety bulletins, etc., to correspond.

The night schools offer courses in reading, writing and spelling of English. If the non-English speaking workman is employed regularly on one of two shifts at a plant operating on three shifts, he may take advantage of this training. This, however, is not always the case and he may be assigned to duties upon other shifts so that his night school studies are interrupted and unsystematic.

A language can be much more readily learned if it deals with a class of subjects with which the student is familiar. A limited industrial course, for this reason, presents a much more efficient plan for educating the non-English speaking workmen primarily in the work of accident prevention.

Personal contact between the active safety committees and the foreign workmen is of importance in securing and maintaining interest and effort. I have found by seeking out these men and presenting to them in crude but simple and direct English the purposes of safety organization, and by evincing a sincere, individual interest in each man's job and its possible hazards, that this seems to go a great way toward winning them over to the cause.

On the other hand, they expect their suggestions and recommendations to be put into effect, as they should be if practical and of merit. They are equally entitled, also, to learn what disposition has been made of suggestions which for good reasons have been rejected or temporarily deferred. Their grasp of English is such, in many cases, that they either fail to understand the explanation, or else they misinterpret it.

Foreign workmen's committees should be appointed rather than successively elected. The duties of many of these workmen are such as to keep them in one place or attending one machine. They are often isolated in their work from their fellow workmen and as a result have little means of determining the relative merits of their working associates as a basis of elective choice for committee service. The appointments of the initial foreign workmen's committee should be based upon merited attainment. Selection should be made of those men who do not often need first aid treatment and yet whose work may be of comparative risk or hazard. Then, small honors, deservedly conferred, but not to be easily obtained, will help to arouse and maintain the interest of their associate employees.

What I have endeavored to show, in a small way, is that phase of the problem of safety education and, consequently, of shop safety organization where, I believe, lies the field of greater difficulties to be overcome, the field productive of the larger number and degree of accidents, and the field which the shop safety plan must take into consideration in order to achieve the highest results in the reduction and prevention of accidents in a large class of industries.

DR. HATCH: The last speaker on the program will speak to us on the problem of "Shop Safety Organization in a Small Plant,"— Mr. Charles Ray, Secretary of John A. Manning Paper Company, of Troy, New York.

SHOP SAFETY ORGANIZATION IN A SMALL PLANT

By CHARLES RAY, SECRETARY, JOHN A. MANNING PAPER CO., TROY

Mr. Chairman and Members of the Congress: I understand this is the Third Industrial Safety Congress. That means, if it is an annual congress, that it has taken me three years to get here, and I am frank to say it might have taken more than that had I not been called on to have a part in the program. This indicates something we ought to reckon with in connection with the Congress and with any work of this sort. In the first place, I think it indicates progress, because of the fact that you can get the representative of a small manufacturer on the platform with the Assistant Director of the American Museum of Safety and the Chief Inspector of the Compensation Inspection Rating Board to consider subjects in which we are all interested. I am frank to confess that after we went under the compensation rating scheme, it took me quite a while to remember what the name of that Board was, and I always had to have the stenographer look it up. That is another item of progress it seems to me.

Here is another item of progress, too. I don't know whether the Industrial Safety Congress has been in the habit of holding its previous sessions in a church building or not, but it is indicative of the things we are learning these days. I go to church myself and I presume all the rest of you do — I mean outside of the Congress sessions.

The church has learned that the saving of the body is a part of the saving of the soul, and so we in industry are learning that the care of a man's body is as much a part of our duty and privilege as to concern ourselves with his output when he is on our pay-roll.

I couldn't help but think of another thing we are learning these days, and that is how to learn from opposite types. I said I went to church. I went once to a meeting of ministers of a particular denomination. You know the reputation the Scotch have for caustic comment. Perhaps the dean of these ministers was a Scotchman. In connection with the discussion of a paper presented one man spoke whose opinion differed from that of the Scotchman. The Scotchman got up and said, "I am always glad to hear Brother So-and-So speak because I always learn something from him. I never agree with him. I never learn anything from Brother So-and-So, however, because I always agree with him." So, while it seems difficult for Mr. Rausch, Mr. Wiberg and myself to agree and go exactly in the same direction due to our diverse conditions, still I think when we get all the elements together we may each learn from the other.

Note these allied flags here. At first glance they represent flags of different nations — the Union Jack of Great Britain, the Tri-color of France, and the Red, White and Blue. But don't you see, as you look at them, that they are all made up of the same colors? That is human nature. No matter how different it seems to us on first appearance, underneath it is very near the same.

My appearance here to speak on this subject of "Shop Safety Organization in a Small Plant" is not because I feel I am particularly fitted for this task, but because I felt that if I refused the gracious invitation to have a part in the program, the small plant might not be represented.

It is not my purpose to present statistics on any subject whatever, but I here call attention to the importance in our industrial fabric of the small plant. If the developments which we are all wishing for in the industrial life of our country take place, the small plant must advance as well as the large.

In the work of the New York State Industrial Commission, I fancy the small plant is no little part of their problem. It is too often true that the small plant, either by location or because it is small, or for both reasons, feels apart or out of touch with the various lines of new thought and development. This may be accounted for by the fact that if the manager of such a plant tries to read up on new developments, he very rarely finds anything that meets his case. Most of the reading matter obtainable is in a form which applies to larger organizations and appeals to him as being too big for his use, and more than his needs demand. Further, in the diverse duties of the small plant executive, it is difficult to find the time for new development, and especially in these last days when it is difficult to find and keep in small plant organizations men of a type who can well carry responsibility; the division of duties is apt not to be well made and the executive finds himself with really too much to do. Under these conditions the temptation is to take the attitude that he can get along without this or that new idea.

The subject we are here discussing, however, is opportune, because it has to do with the development and conservation of the human element in our business. We all recognize that in times past our attention has been given too much to machinery and processes and too little to the welfare of the men and women with whom we work. The small organization man, as well as his brother in the larger organization, has heretofore not, as a rule, given very serious thought to the problem of attracting help and caring for their interests. There are lots of elements in the present day situation, however, which force on us a change from this old attitude, and in the way of progress now before us it seems the safety organization should particularly play an important part even in small plants. Under the old conditions there was not much need of safety instruction because many plants were manned almost entirely by old and experienced men of a type that largely looked after themselves. Now, however, the plant in which such a condition obtains is most unusual, and with the new men in our business who are unfamiliar with out work and its dangers, safety instruction is needed. In addition to this, most lines of industry to-day are attended with greater risk than previously on account of the speeding up which has taken place in nearly all processes. There is a positive weakness which, no doubt, many of us have seen, that if new men are taken into our organizations and not instructed in the processes, including the important factor of safety, there is failure to create a condition which arouses their interest. Men are not likely to remain long in the service of such an organization, and certainly the conditions obtaining in such a plant are very likely to be such as do not call forth any feeling of loyalty on the part of the employee.

In the glorious achievements of our army we have before us vividly the importance of morale. Morale springs from the spirit of the individual and very few industrial plants have given proper emphasis to creating and maintaining on the part of their men the spirit of which we have been so proud in our army.

In weighing the value of our men, I think we have all had the experience that the individuals earn their pay by different qualifications and for different reasons and, I am sure, that many of us have been well content to continue on jobs individuals whose skill may not have been of the highest order but whose spirit was an important factor and a decided asset.

If we take men into our plants and show them that we have a plan for our work and are thinking of their interest, including their safety, also show that we have a fair amount of ability to look at things from their point of view, we are in position to secure the workers' co-operation. This is a condition we are all striving for. Many failures in so-called welfare work have been due to the fact that the workers' point of view and natural needs were not fully considered. There can be no success unless there is co-operation in such a way as will indicate an interest in our men and secure their co-operation in making it effective. If we shall use the safety organization in such a way, I am sure we shall have done well and the advantage so gained will be much more important than the item which might at first make its appeal to us, that is, the saving in our compensation insurance.

I commend the plan for shop safety, sanitation and health prepared by the New York State Industrial Commission. My own company has benefited by it although we have not adopted it. Of course, it is trite to say that no such plan should be adopted; it ought to be adapted. In our own organization, representing two different mills employing about 100 individuals each, we have had very good success with an inspection committee in each composed of the superintendent, master mechanic, and the man who renders first aid in the case of an injury, and who also is responsible for reports of accidents and running record of same. Let me stop here to say a word about the first aid man. An important person in any organization for the promotion of safety, sanitation and health is the first aid man. It is not necessary that he be a trained nurse but he should be an individual who likes this sort of work and takes an interest in it, and he should be sufficiently instructed by your doctor to be able to render efficient aid in cases of need. This may mean saving lives; it surely will mean saving numberless visits on the part of your employees to the doctor and will keep them at work when you need them. Carefully cultivate the responsibility on the part of the worker to report even trivial accidents for first aid treatment.

Our inspection committee is spurred to activity not only by the recommendations of the state factory inspector, the insurance carrier's inspector, and all the reading matter I can give them on the subject of safety, but also the desire of each to be free from accidents for which he can be criticized, and to maintain a condition in which any inspector who visits us will find it very difficult to make additional new recommendations. We find very helpful in keeping the thought of safety before the men the bulletins issued by the National Safety Council, 208 La Salle St., Chicago, Illinois. These are first carefully looked over and those applying to us are regularly posted on the mill bulletin boards. A most important factor in checking up the work of our inspection committees as well as all our operating conditions is the welfare committee. I am frank to say that I consider this welfare committee to be of utmost importance in all relations with our men. This welfare committee is composed of two or three workers from each of the two mills *who are appointed by the men*, the superintendent of each mill and a secretary and is presided over by the manager of both plants. Here every human relation and working condition, including safety and accident prevention, is thoroughly reviewed, the men contributing their ideas clearly and fully and not only theirs alone but the ideas of all the employees which are presented to these men as their representatives. I desire to commend strongly the welfare committee in our own organization and recommend the idea to the serious consideration of others.

That industry shall have a new birth in these new days resulting from the wise and complete co-operation of employer and employee should be our goal, and definite part in this mutual effort should be for the safety and health of the worker.

GENERAL DISCUSSION

DR. HATCH: Before we go on to the general discussion, I have been asked to give notice that there will be a meeting of all the inspectors of the Department who are here in this room after the close of this session.

The four papers which have been presented are now open for discussion.

MR. WILLIAM RANDER, General Organizer, Brotherhood of Painters: I do not rise to criticize any of the papers that have been read, but I rather desire to call your attention to some omissions by this Congress.

I have listened to some very interesting papers in the last few days, but I have been waiting to hear something said about the ages of men working in the erection of buildings. We have heard of the danger to the man operating a machine or a loom in a textile mill. No one would say that it would be more dangerous for a man to stand on a solid floor operating a machine than for a painter to hang on a rope painting a church steeple or for an iron worker to connect girders forty stories in the air.

I would suggest to those in charge that at the next Congress some attention is paid to the dangerous occupations in connection with the erection of buildings.

Last Monday I spoke to one of our largest contractors in the state who was visiting in Syracuse and invited him to come here with me, but he had looked over the program and he said he didn't think there would be anything of interest to a building contractor. That is really the reason why we haven't any of our prominent contractors — building contractors — in the State of New York at this gathering. There may be a few. I, therefore, respectfully suggest, Mr. Chairman, that some attention be paid to the building industry. Some interesting papers can be read at the next Congress to educate the workers and the employers in the building industry.

The situation in this respect is all right on the main streets, but if any of you would travel with the inspector to the side streets and see the scaffolding and the ropes tucked away in the dirty, filthy, damp cellars for the winter and taken out in the spring and the men told to go up on these scaffolds, you would think there was some danger in the building industry.

It is for that reason, Mr. Chairman, that I bring this matter to your attention — with no criticism, but in the hope that you will add this feature to your program next year.

DR. HATCH: May I take a hand in this discussion long enough to just say one word along the line that has been suggested. Unfortunately, I was unable to attend the Safety Congress last year. I was here two years ago. I recall that at that Congress attention was called to the grave hazards in the building industry which didn't seem to be given special attention by that Congress. I think every one felt that the points then made were well taken, and I feel very strongly that the point just made now has been well taken. I am sure the Program Committee for the next Congress will be glad to bear that in mind, but the State Industrial Commission has been doing things along that line and that is what I want to call attention to.

Growing directly out of the subject discussed two years ago, there is now at work a Code Committee of the Industrial Commission, endeavoring to work out a set of rules and regulations which, when adopted by the Commission, like all such rules and regulations, will have the force of law in the State to regulate building operations with a view to the prevention of accidents. I can assure you that that Committee which is composed of both employers and employees in the building industry is working hard and working constructively to go as far as it can and produce the best results and best set of rules and regulations which seem possible. While it didn't get on the program of this Congress, and that may have been an oversight, nevertheless some substantial progress is being made along that line.

MR. T. M. GAFNEY, Editor, Industrial Weekly, Syracuse: Perhaps you will allow me to say that, as I represent organized labor, I am not unmindful nor ungrateful to the big State of New York which, through its Industrial Commission, is doing so much good along this line. May I say, too, that I am not ungrateful to the large number of employers of labor in this state who, at considerable expense of time, effort and money, are here with their state experts and committees, and I believe in many instances they are paying the entire expense.

While, of course, it is true, and particularly so with the self-insurers, that the smaller the number of industrial accidents the larger the amount of money they may save through that medium, yet I don't desire to be understood that I think for a minute that these men are actuated by that motive. Let me say that I have the belief that much of our well intentioned efforts in the line of industrial safety are misdirected, as I see it, for the reason that they are handed down from above through a paternalistic proposition and brought into being through the medium of force rather than through the other process of working from below through the medium of education.

I was mildly shocked the other day upon this floor when I heard a representative of one of our large manufacturing institutions of the state say, in practically these words, that it was his policy to dangle before the eyes of the workers of his institution their jobs as a prerequisite to their wearing certain safety contraptions which he decided they should wear — and that in a democracy.

Let me say that I believe a great deal of good is coming from these Congresses. May I say to the large employers of labor that the machines are yours, that you are privileged to put upon these machines any or all the devious or dubious contraptions which your imagination or experience may suggest, because they are your property, but the men who operate these machines are not your property and you have not the right to operate them as you do the machines. That isn't saying a word against the apparatus or its usefulness, but it is against the system which will compel an American working man to wear any kind of a harness against his own will in industry in this country. If it is right morally or legally that a workman may be obliged to wear certain safety devices upon his hands or upon his eyes that these may be preserved for better efficiency, then by that same method of reasoning, the things that he eats and drinks may also come under the same general ban for his digestion may be also useful in that same line of efficiency, and with that come the various other things that may be included. Although these words may be a little strong, I say it is a natural assumption that if one is correct the other may logically follow so that in the end to the average American workman he may conclude that he may as well tear up the constitution of the country and hang a crepe on the Statute of Liberty, for Liberty would, therefore, be dead.

I appreciate that it is easy to criticize. It isn't always easy to offer constructive suggestions, and so I say that the safety organization should proceed from the bottom rather than from the top. The men through the medium of education should be made to understand the importance of shop safety.

To send a pamphlet through the shop that the average worker may read, to say that in the State of New York there were 500,000 men engaged in a certain specific piece of work or at a certain machine, and to say that of those 500,000 some 500 of them lost their hands or their eyes, doesn't mean much to the fellow except that he will read and forget. He should be made to visualize these things through the instrumentality of pictures. The pictures might be made and enlarged to the size that is needful and then be put up about the shop and the benches or the lathes wherever the men are working, so that from hour to hour and from day to day they will be made to visualize and understand the real meaning of the fact that 500 men in his line of work have been injured during the year. I have the idea that with that sort of an organization we have the only method of securing active co-operation of the workers in the shops and factories, and only through that active co-operation can we hope to secure the results which I believe we deserve, which the Industrial Commission and the employers of labor in this state really and honestly deserve by their interest in these Congresses.

MR. PATRICK SHEA, Factory Inspector, State Industrial Commission: I intended to reply to the first speaker of the morning and I didn't get a chance; then I intended to reply to both the first and the second and then both the first, second and third. And the longer time I had to wait, and the more speakers who spoke, the more I had to think about and I have come to the point now where I guess I had better not attempt to do anything. The term "safety engineer" with emphasis strikes me as being important. There are some people who lay stress on titles, although we have spent several million dollars during the last few years to abolish the necessity for titles. I know some years ago I was at a Congress of employees and employers and I found that I made a great mistake by referring to the operator on a railroad engine as an engineer; he is called the engine man.

I know that technical education is an advantage to a man who assumes the position of a safety expert or safety engineer, or whatever you wish to call him, but a man doesn't have to have a lot of education to have the sense of danger. A man to be a safety expert, and qualify as such, must first acknowledge that there is such a thing as danger and he must have imagination enough to see the possibility of danger in some place where an accident has not already happened. The great trouble with dangerous conditions in factories has been that we have had to wait until somebody was killed or maimed before we realized there was a dangerous condition present.

The employer, or head of the concern, it has been suggested, must be the one to select the safety engineer. I believe that is true, but I think that when the safety engineer or expert has been accepted, his first job will be to convince the man who has selected him that there is a dangerous condition in his own factory, and his next job will be to convince the employees that there are certain operations that are dangerous. My experience has been that some of the very best work in devising safeguards has been done by men who were not technically trained but who were trained from experience. I believe that a man who is devising a guard for a machine or who is devising a safeguard for some other dangerous condition, who has been on the ground and operated that machine, either in that particular plant or some other, would have more influence with the men who are operating that machine or working in that dangerous condition than some man who has come from college or some technical school. That is human nature.

Even technical men disagree. I think we had the experience yesterday morning of having several doctors here disagree very much on the manner of chasing the elusive bug. If the safety engineer has a sense of danger, if he has mechanical skill to provide safeguards and if he has enough tact to convince the employee that certain safeguards are for his benefit and for his well being, he can get along very well without a college education, and if it becomes necessary for him to have the advice of a college graduate, he can get it in the few instances where it will be necessary and perhaps get different advice from different graduates of different colleges and then use his own judgment as to which is the best advice.

As far as the last speaker is concerned, I don't agree with him either. I, too, have had something to do with labor and I have very high regard for the rights of the working man, but I believe that when in Rome you should do as the Romans do. I believe that if a man accepts a position in a factory, or in an establishment, in which necessary rules are enforced for the well being of the proprietor and his employees, and if he does not want to work under those rules, he has the right to walk out. The fellow who stands on his dignity and resents such suggestions is a menace to the shop. I would probably diplomatically or actually take that fellow aside — not in the presence of others — and say, "You are too clever for this place, young man, you belong somewhere else." I'd let him go. That fellow retards the safety movement, he discourages and lowers the morale in a factory. The safety engineer, or the fellow who is trying to establish safety in the shop, has more trouble from the fellow who resents shop rules than from any other source. I am positive that the man who got rid of the fellow who wouldn't use the goggles probably did it in a more tactful manner, but in its essence, or in fact, he was perfectly right. He knew it was to the interest of the employee that the goggles should be used. If there is some fellow who will not use the goggles, thereby setting a bad example, I would not bawl him out or tell him to get out, but I think I would get rid of him and not have him setting bad examples for other men.

MR. J. L. GERNON, First Deputy, New York Industrial Commission: I want to say that I agree with my friend Gafney and disagree with him. I am with him on the question of education. I am in the labor movement and there is no movement that requires as much discipline as the labor movement. There is no better organization for the promotion of health and safety than the movement itself. All the safety movements that we hear about, and all the talk about them, never equal the labor movement which started years and years ago to be a safety movement, and the education that safety engineers have in the question of safety got its basis from the labor movement.

The theory on which the labor movement requires safety is that no man in any industry has a right to jeopardize the interests of another. If it is possible, by the use of apparatus or by education, these methods should be used. We hear today (and it is getting to be more familiar in every session of these Congresses and in every gathering of safety men) the question of safe practices. That originated in the labor movement, and I can remember the time when you would have a gathering of safety men and they never thought of the question of safe practices. The education that is needed in industry is that of safe practices. There are more people injured in unsafe practices than there are with unsafe machinery. We are getting to the point where machinery is reasonably guarded. There is much to be done, but we are getting to that point where workmen are not so liable to accident.

We have always heard of the turnover in labor. I said last year that I know a plant in this state that in one month had 2,500 people go in and out of the plant in its effort to keep up with its normal labor condition and that wasn't a war condition, so that that firm would have to do a lot of educating to keep that number of people thoroughly educated in the safe practices of that industry. So it is necessary to educate men and we will never have a safe condition in industrial lines until we do.

I am like Mr. Shea. I agree and disagree with all of the speakers. I don't care what you call the safety engineer, I don't care how well he is educated,— he is like a man with his faith; if it isn't in his heart but it is on his sleeve, he does not amount to much. So in this movement you have got to have the question of safety in your heart. If you haven't some sympathy for humanity, as was said here in a previous session by one of the speakers, then you are not good at the movement, I don't care whether you were trained at the best school in the country or not. The practical business man doesn't hire a man because of his name, he doesn't hire him because you call him an engineer or a coal shoveler. He hires him for his ability, so if he is a safety engineer or any other kind of an engineer, if he can fill the job, that is the man to have. He may be the most educated individual in the country and not be of much use in the factory. Bear in mind — there is nobody who is stronger for education than I am. I have gone through the school of realizing what the need of education is. I had to go to work when I was eleven years of age and I have been strong ever since for keeping every child that I know of, whether it is black or white, or any nationality, in school until it is educated.

If we are ever going to succeed in this country, we must do it on the basis of efficiency. We can't compete with the countries of the world unless we have efficiency and the kind of education and training that makes for success. If we are going to see that children are taught in school things which are of no good to them in industry, then we are not going very far, but if we can make our school curriculums fit industrial life, then there is some opportunity for success, and as men and women develop in industry with a basis of education, they can learn the things that are essential for the industry which they have to follow.

Bear in mind that it is not an easy thing to get out of the first industry that you enter. We pretty nearly all realize that. You may be so fortunate as to get into a good one and you may be unfortunate and get in a poor one, and it is a hard job to get out, so that it doesn't make any difference what you call the man — the question is — can he do the job?

I realize very well what Mr. Rausch meant. I think his talk was very excellent, but I want to say (and it is due to the manufacturers of this state and it is due to the employees of this state that this should be said) that the biggest fool work that we have found in safety work in this state was put in by safety engineers who were technically trained. I have in mind the best job ever done in this state and it was put in by a man who was just an ordinary machinist. It is the best job that I have ever seen and I have seen a good many of them. We find that the safety man is not always to blame, and I'll tell you why — because the fellow who is running the plant hasn't got safety in his heart; he doesn't let the safety man do what he would do whether he is technically trained or not. He is not permitted to do the things that he should do. I am coming to a realization every day that the safety man should go further than has been stated in any of these plans of the speakers of the morning. Last year we had the question that Mr. Ray touched on this morning — the question of teaching English.

I took the position years ago, and was severely criticized, that if I had my way I wouldn't stand for the publication of any poster in any factory unless it was in the English language. It is pretty nearly time that the English language followed the American flag. I said then, and it is well to repeat it now for those who weren't here, that the inspectors of this department have seen all the ills that have come from the segregation of foreigners and the impositions that are put on them by their own people. Any men, whether he is highly educated in his own language or not, when he goes into any country and cannot talk the language, is the prey of some one else, and if you don't think that is so, let me tell you a little story.

The Labor Commission that went over to Europe went to France and England. When they were in England, they could talk the language. When they went to France, they could talk a smattering. They went to Italy and when they got there, they were in a bad way. In Italy they bought jewelry from an American and the result was they had to go and get their money back, because their own people exploited them and made representations that were not right. Fortunately, they got some expert advice from people who knew the language and the thing was corrected. It only goes to show that any one of us is at the mercy of the people whose language we can't talk when we are in their country. In industry the things that should be posted ought to go up in the language of the country and the people should be taught that language. When they know the language they are free, they are no longer shackled.

I have been trying to study for the past ten years how I could capitalize what could be saved in industry. When I solve it I will throw up my job. There is more money wasted in industry than you, and the man who runs an industry and is honest, will admit. Industry has its problems. The fellow who is running it has his and he is a very busy man if it is any kind of a business, so I have become convinced that the safety man must go further than the question of safety, and if I were running a plant of my own the safety man would be the production man, he would be the trouble man and he would be the employment man. Somebody will say that is a terribly big job to put on a fellow. If the plant is very large he can't do it all.

Anybody can tell whether an ordinary machine is safeguarded. It doesn't require a wonderful lot of experience to look at a certain machine that has a lot of gears and tell whether they are covered up. There are some machines that are difficult. There are some machines that you have to stand over for hours and days and study the method of operation, because as soon as you interfere with the progress of the machine it is a serious problem. The operator generally makes his kick and he is justified in doing it. We would all do it if we were put in his position. If the question of guarding is the question of reducing production, it is serious, but if it is necessary to reduce the production to save lives and limbs, then let us reduce the production.

If I remember rightly, I think it was Mr. Ray who said that his old employees knew how to take care of themselves but the newer ones didn't. Gentlemen, that is the science of the whole thing. Work is just as scientific as anything else. Everybody can't play a violin because they have never been taught how and everybody can't work unless they are taught how. There is a scientific way to work. If we knew enough about teaching men to work properly, there would be less hernia cases in this state and in other states. There isn't any question about that. What we should do is to study the practices.

I want to inject this thought here on the question of building construction. We all know about the hazard. We know what they give men to work with. In fact some of them don't give their men anything; they tell them to go out and steal what they can get on the building to make a scaffold. It isn't only in building construction either; you have that to contend with in all the other operations and industries that the compensation law covers. The Industrial Commission of this state, to my mind, should have a law that would permit them to make safe practices in any industry that the compensation law covers at least.

The compensation law, if I remember rightly, has forty-six groups and we cover by inspection twenty-five of them. Some of them we cover wholly and some of them we just touch, so that about half of them are covered by inspection. Longshore work, as I understand, runs pretty high in the list of hazards and people are being maimed and crippled every day in that line. Human life there is just as valuable as anywhere else, and the law should be broad enough to include them all.

If we could save just one-tenth of the loss in industry, we could turn around and pay the man his full wages. That is just about the situation. It is a big field and requires a lot of study. There isn't any question about that.

One of the greatest difficulties we have is to tell a man who has guarded machinery to do it over again. Sometimes he has spent a lot of money to guard it and has created a second hazard and often hasn't covered up the first one, so when you tell him to do it over again, believe me, you have got a subject fit to be tackled.

What you call a safety engineer doesn't seem to me to be one. What they call a factory inspector is terrible to behold. Let me say this: The whole horizon looks good to me. We have made a lot of progress, and I don't want to leave my feet without saying that there is an impression that goes forth among the labor men that the manufacturers do not co-operate. I don't think it would be fair if we didn't say that we get lots of co-operation. Occasionally we have to put on the pressure that is given us by law. The best illustration of the co-operation we have had is to tell the record of the department for the last fiscal year. We have secured compliance with 49,000 and some odd hundred orders issued in safeguarding alone. You are familiar with the methods that we use,— sending out a notice, telling them that if they don't put the guard on in a certain length of time that we will tag the machine as unsafe. We sent out thousands of those letters and in only 933 cases last year did we have to apply the tags.

MR. D. B. GILMORE, Inspector, Compensation Inspection Rating Board: I take exception to some of the remarks by Mr. Gafney in regard to workmen's constitutional rights. I happened to be in a plant here in Syracuse only a few weeks ago. Just as I entered the door I saw the sign "No Smoking." I saw one of the workmen take a cigarette out of his mouth and throw it into a basket of paper. There was ignition and they had to use a fire extinguisher. The foreman was talking to me and I said, "Who is the fellow that threw the cigarette into the basket?" He said, "Don't say anything. He is the dean of the chapel," or something else. "If I make him stop smoking you know the results." Was that man standing on his constitutional rights as an American citizen by smoking in that factory with about fifty or sixty females working on the floor? I leave that to the audience to decide.

MRS. JANE D. GANOUNG, U. S. Employment Service, Olean: I just want to give this thought to the manufacturers regarding the non-English speaking women, the foreign speaking American women who have left their countries and come over here because it was expedient to follow the one man on earth. That woman has educated her children in American schools, and you have no idea of the sacrifices these women have to undergo who do not speak our language. They have to do the work in the shops that the American women wont do. The foreigners have it all over us physically. The women I have had to deal with were of various nationalities and I finally succeeded in getting a woman who could understand several languages. She could speak Russian, German, Polish, and she spoke English very well. There were men employed with those women from all over the world. What I couldn't get was what those men were saying to those women. A woman who understands those languages could get that; I couldn't.

I can give you an illustration of how the foreign speaking woman is exploited unconsciously by the man in charge. This case I speak of was just a way of joking with the foreman; he didn't absolutely sense the danger. A darky and an Italian woman were working close together and the darky kept annoying the Italian woman. She went to Tony, the foreman, and said: "That nigger is bothering me. What are you going to do with him?" He said, "Oh, knock him over the head with a shovel if he bothers you any more." That was the easiest way out of it. He didn't want to bother with Mary's complaint. So one day the darky threw an apple and hit Mary in the side. Mary hit the darky over the head with a shovel. Mary lost her job and so did the darky. Neither of them were desirable working people. They were both menaces because they were more concerned in having some sort of a squabble than in their work.

That is one of the conditions you are going to meet if you don't get some woman who understands what is going on, and she will save in time spent what it will cost to keep her.

Mr. Wiberg: In mentioning the rating system in connection with safety organization in my few remarks I merely cited that as an example of the importance attached to that work by the insurance companies and by all parties interested. Now, the rating board and the rating board inspectors and the insurance companies, I believe, have lost sight more or less of the money part of that proposition. It is unquestionably true that rating was introduced to induce the employers to safeguard their equipment, and that being the case I submit that the primary and fundamental object was the elimination of accidents and the saving of human life. The other part of it is secondary.

Now with respect to the point Mr. Gafney raised — at the last Safety Congress the question of mandatory orders versus education was very ably discussed by representatives of the Bureau of Labor Statistics of the National Government, and one very interesting talk was given by Dr. Chaney in which he gave examples of the results in two large plants where these efforts were carried on by those two methods — one by force and the other by education. As I remember it, at the outset the plant where the mandatory order was in effect showed the best results for a few months, but after that time the other plant quickly outstripped it and at the end of a year or two the first plant revised its entire system and capitulated to the education system. In that connection it seems to me that so far as I am able to gather from all the people interested in the problem and all people furthering that work, there is a decided and strong swing towards the educational side.

Mr. H. G. Meacham, Goulds Manufacturing Co., Seneca Falls: There is an old saying that poets are born and not made, and the same is true with regard to the safety engineer, the safety inspector or the successful member of a safety committee. One qualification of a successful safety engineer is belief in his job, because if he doesn't believe in it, how in Heaven's name do you expect anybody to believe in it? Next come tact and ingenuity. I think those three will lend themselves more readily than any educational qualifications to success in this work.

Mr. J. H. Hansen, Secretary, Safety Council, Rochester: I would just like to say a word with reference to education. In Rochester we have found that education is the very foundation of success in safety work, both public and industrial. We start there in the schools and wind up with our educational program in industry. We have several large concerns doing efficient safety work. We have found that two-thirds of the accidents that have happened in industry can be avoided, that 75 per cent of the results obtained are obtained through education and 25 per cent through safeguarding.

Mr. G. Haustein, American Lithographic Co., New York City: I want to say a word regarding the first aid attendants and the experience the company I represent has had in educating the first aid attendants to handle the work. We found that the general text book given out by the different organizations on first aid work went too deeply into the work entirely. We found that if the plant physician will instruct the first aid attendants in the particular line of first aid they must follow, it is better rather than the other method and better results are obtained. We have formed a first aid organization and it has been in effect since last year. Since that time we haven't had one case of infection. The reason is that the attendants worked under the supervision of the plant surgeon. The instructions in the text books are entirely too deep for first aid attendants.

DR. HATCH: Is there any further discussion?

MR. S. S. LANDON, Todd Protectograph Co., Rochester: I would like to ask Mr. Gafney if it would be a good plan to put forward a campaign of education in all the unions in the state, that is, get their co-operation.

MR. GAFNEY: I should say that would be a very good idea. Any way that we can bring the education to the working people we want to take, that is, any way that will be a good way, and any attempt that we may make to force that upon the working people will, of course, be a bad way and while it may succeed temporarily, it isn't the kind of success we want.

MR. LANDON: I think if Mr. Gafney will say that the unions will give the consent, the manufacturers will be right on the job to help them.

MR. J. J. SULLIVAN, Factory Inspector, State Industrial Commission: I have listened, Mr. Chairman, with a great deal of interest to all the papers that have been read at this Congress, and I must say that I have acquired a lot of good, solid knowledge from those papers. I did not intend to speak at all. However, during the course of the reading of the papers, I jotted down a few notes which I will endeavor to touch upon very lightly and very briefly.

In the first place, while the thought is in my mind, I want to disagree with Mr. Gafney as to coercion in the use of safety contrivances and appliances on the part of the working man. For over twenty-five years I have been inspecting factories for the city and the State of New York and I have found in my experience that there are a very large number of men indeed who will absolutely disregard every safety appliance that may be introduced or applied for their particular benefit and safety unless you compel them by statute or otherwise to wear or use the appliances afforded.

In conversation with another old inspector in our Department the other evening, both of us seemed to have had similar experiences in a little different line of industry. I recall some years ago going into an ice plant in the city of New York. It so happened that they had a table there with a number of saws on it. The room was dark and it was a cloudy day. The light, the absence of which is always an element of danger, was very poor. We were speaking about the saws which were not guarded. I called the attention of this old gentleman to the fact that one of them was not guarded. He said, "Oh, well, that doesn't make any difference. The guards are there; they can be pulled down when we are using the saw." The saw was actually running, but running lightly and in the darkness he could not perceive it. In order to prove to me that he was correct and that the saw was not actually running, he went over before I could drag him away and put his fingers on the saw. To his sorrow and to my sorrow he found that he was wrong.

A gentleman told me of his experience where another man in a paper mill put his hand in a paper cutting machine — put it under the knife, and he knew there was a possibility of that machine repeating. In spite of that fact and in spite of his being an old trained employee he put his hand under the knife. The machine happened to repeat at that time and the man was unfortunate enough to lose a hand. We know that unless we exercise all our best judgment, and unless we compel these men to use the guards, that they will not use them. Why do they not use them in some cases? Sometimes for mercenary reasons. Perhaps the man is on piece work and wants to get out a little more stuff and the guard slightly interferes. He casts aside the guard when nobody is looking and pushes ahead until fatigue overtakes him, he loses the rhythm of motion, he forgets the turn of danger near and in an instant he becomes a derelict to be thrown out on the world — on the human scrap heap along with hundreds of thousands of others who have been cast aside when their usefulness was gone and nobody could bring it back to them.

Employers are very anxious, I find,— some — not all of them — to apply safeguards provided they do not interfere with the operation of the work, and provided that they do not interfere with the output of that particular machine. They are not so interested about the safety of the man's life or health or his fingers or his limbs as they are about the lessening of the product of that particular machine, and they will only apply those guards when the force of law compels them to provide them, no matter how cheap they may be. I know of one case where it would only cost 25 cents to apply a guard to a saw cutting glass tubing that would have kept particles of glass out of the eye of the operator, and yet that employer had the nerve to tell me that the employee couldn't see through the little piece of glass in the guard.

There are men in the State of New York who stand as pillars of honor and justice in the treatment of their men and women, but I want to tell you right now that there are a lot of scoundrels in this state who care no more for the welfare of their men and women and children workers than they do about the life of a dog or a cat, and I know it.

I have heard a great deal said about the cause of accidents, and I have heard it said that they are a result of carelessness and ignorance. Have we stopped to consider for a moment the cause of this carelessness? Have we gone deep enough into the subject? Have we gone down into our hearts and searched and tried to make ourselves give the right and true answer, or have we been content to let it slide by as a passing thought? I have worked in factories myself. I know something about them. I have learned in my experience that one of the great causes of accidents in factories and on buildings has been fear. Fear of what? Fear of losing a job, fear that when the boss comes around he may see the workman a little lax and not moving forward as rapidly as he might, and whether by look or by action that man is made a pitiable object, or that woman, whichever it may be. He, or she, is trembling with fear, and while in that state, how can we expect a man or a woman to maintain self-control, especially where their occupation is dangerous?

All of us know how poorly we work and operate when we are controlled by some violent thing. We are nervous, we are overstrung, we get all out of shape. My friends, I want to tell you that that is one of the greatest causes of accidents.

Another great cause of accidents may be that the man or woman may not have had enough to eat or enough sleep and they haven't the energy to perform the tasks which they are set to perform.

I said I would only touch very briefly on those subjects, and I think I have overstepped the bounds. However, I trust that what I have said or the point I have discussed will at least have some consideration, and that the men and women of this state will be given a chance to earn enough money to keep themselves in decency and in good health so they will not become the nervous, physical wrecks with which our asylums and our institutions are filled.

MR. L. A. HAVENS, Chief Factory Inspector, New York Industrial Commission: Mr. Chairman, the manufacturers who attend a Safety Congress of this kind are not the kind of manufacturers that Mr. Sullivan refers to. He is the enlightened manufacturer, the manufacturer for safety who is already converted, who attends these conferences. The fact that he is enlightened is demonstrated by the fact that he is here.

I would venture to say that there probably are not over 150 manufacturers in the State of New York represented here in this Congress, whereas the inspectors have to deal with about 60,000 outside of the 150 that may be here, so that in speaking of certain conditions as found by inspectors, it relates to those establishments run by a class of employers that many of you don't conceive as being possible to exist. Although Mr. Sullivan's statement might to some degree sound overdrawn, exaggerated or hysterical to some of your minds, those facts do exist in some factories.

The gentleman who spoke for the cement works gave statistics relating to three classes of employees, the non-English speaking employee, the employee who had come here from another country and had learned English or, in other words, the English speaking alien, and the remaining class which we will term the American class. We have always been led to believe that the American class was the brightest class, the best workers and, along a given line of work, probably the most exempt from accidents. Yet we find from those figures as given that 30 per cent of the employees were non-English speaking and 40 per cent of the accidents occurred to them, that 20 per cent of the employees were English speaking aliens and but 10 per cent of the accidents occurred to them, that 50 per cent of the employees — the remaining number, which must be 50 per cent — had 50 per cent of the accidents. How does he explain the fact that the ratio of accidents to English speaking aliens is only one-half of that of the American people or the American working men?

MR. WORTHINGTON: Those are the figures that I found in the book of statistics which the Portland Cement Association publishes. They are truthful in so far as I can determine.

MR. GERNON: Would Mr. Worthington give his opinion, having employed alien workers and had some experience with them, as to the value of posting nothing but English notices in plants?

MR. WORTHINGTON: To be brief — it is over their heads entirely. It has no practical value to them. Many of them can't read at all and I can't see that it has any actual benefit.

Mr. Gernon: Can they read their own posters when they are not educated? Isn't the thing parallel as far as that goes?

Mr. Worthington: Yes.

Mr. Ray: I would like to contribute just a word of personal experience. First, I want to say that we all agree on the benefits of education and that that will be the fundamental line along which we shall progress and grow.

With reference to the subject of whether the unions would permit that safety working program being brought to the union meetings — we have tried that and we have had it brought up at union meetings, but the men must be interested and educated in it. I requested that the State Industrial Board be permitted to interest them in it.

Commissioner Lynch: We have entirely lost sight of whether we will elect a safety committee among the men, or elect the foreman or the Secretary and Treasurer of the company as a safety committee. Should the education come from the top, from the men who are the least concerned and the least subject to having their hands cut off, or from the men who are actually working and who should be directly interested in this safety movement and given credit for intelligence enough to form a committee to make suggestions to the management?

Dr. Hatch: I think Commissioner Lynch has given us the closing word. We will adjourn until 1:30 this afternoon.

THURSDAY AFTERNOON, DECEMBER 5

PRESIDING OFFICER: ARTHUR H. YOUNG, INTERNATIONAL HARVESTER CO., CHICAGO, ILL.

MR. YOUNG: Any thinking person is rather appalled at a consideration of the general topic of reconstruction. Almost since the signing of the armistice our thoughts of war have stopped, and with a facility that is inimitable in any other nation we have turned right-about face and are now, instead of thinking thoughts of destruction, concentrating all our efforts on getting the Hun and trying to exterminate him, attempting as a unit to begin constructive measures which will safeguard not only to us but to future generations the fruits of that victory for which our boys "over there" so nobly contributed. It is true that we still have thoughts of war. Our boys coming back to us bring the tales of our accomplishment "over there" and we hear from their fellow soldiers of other nationalities the fine tales of American heroism, and we need those tales to spur us on to a better realization of the things for which they fought.

Our press, our newspapers, our magazines, our engineering journals, have been filled since November 11 with articles on reconstruction problems; while we have been here in this four-day Congress some 800 representatives of all branches of society have been meeting in Atlantic City in a most important reconstruction conference. Our parts here are probably rather minor in the whole cast of characters that are to stage the ensuing drama in the world's great conflict, and yet I am sincere in the belief that the parts we will play as safety workers and the part that safety will play in the reconstruction program will be of increasing importance. All of us who are here have witnessed the birth of the safety movement. I think it was only back in 1905 and 1906 that the first thoughts were crystallized into definite action for organized safety work, and almost within a decade the movement has become far more than national in its importance and it has achieved a wonderful success. We are beginning now to demonstrate the successful efforts, and by that success will possibly wipe away the mantle of shame which might have been thrown over us because of the wanton loss of life and the great amount of suffering which was due entirely to preventable accidents.

A great deal of thought has been given the safety movement by all manner of men and women. We have had the finest engineering minds working on it. The lowest workman in the temple has thought safety; our colleges are teaching it; our school children are studying it. At home, on the streets, on the farms, everywhere has safety become a first consideration, and because of that fine concentration of thought there has been evolved a sort of definite program in safety work, a unanimity of action which is rather striking.

No matter where we inaugurate our safety campaign, whether it be in a small shop or the large factory, in a community or on the highways, we come quickly to a realization that we cannot be successful until we have the active and hearty co-operation of every one in that movement and to secure that we have come always to the safety committee.

In our shops the workman, the foreman and the owner of the business — all three — meet jointly around a conference table. In our public safety campaigns, all branches of society meet for a common cause in a mutually profitable effort, and so I say in every safety propaganda that is inaugurated we have that striking unanimity. The safety committee embraces all of the component factors in that particular problem and they all work toward a common profitable endeavor.

There has come an economic justification for the safety movement. The owner of a factory has seen his insurance premiums constantly diminish. He has seen his casualty costs suddenly decrease, and that has brought him a dollars and cents profit which might not originally have been foreseen in a purely humanitarian movement. On the other hand, the workman has been freed of that dread of hours of suffering or death because of his occupation, and our public charitable institutions are no longer being crowded by the victims of industry. It is just that unanimity of action, that common counsel, that working for a mutually profitable endeavor, that is going to give us the opportunity of playing an increasingly important part in the reconstruction program from now on. Probably the most important part of the general program of reconstruction of the country or, indeed, of the world will be the readjustment of industrial conditions. The sudden abrupt cessation of hostilities has allowed us to realize just to how great an extent industry was mobilized for war. Now, with the heat of conflict slackening, there is coming a disintegration. It may be that the heat of war, the flame of war, fused us into an integral mass. We allowed ourselves to be led by a common leader and we registered our faith in democracy by concerted action, but now we are witnessing, with that slackening of the flame, a recrystallizing into the the component parts and they are taking on new alignments.

It would be idle to deny, and wrong to ignore, the fact that there is at present an indication of a greater industrial unrest here and abroad than we have ever before known. It may be that certain interests are rather selfishly trying militantly to keep for themselves certain benefits which were possible of accomplishment as war measures and which are not consonant at all with a peace program or normal operations, and instead of that natural willingness to subserve our own individual ends toward the fulfillment of a common good, we may possibly now be experiencing the very reverse.

Certain it is that this is a time for sober counsel and calm, deliberative judgment. It is not in our province here to discuss the programs of statesmen and monarchs, of capitalists, of labor, organized or unorganized, or of socialists or of Bolsheviki. We are here interested only in safety, but it is just that subject of safety which enables us to gather all of these forces around a council table in calm deliberation, and I say to you, ladies and gentlemen, it is my honest, my sincere belief that just to the degree that we carry on in our work of safety in the rehabilitation program, in our Americanization efforts, in our educational programs and in our functionalized employment, just so far as we carry on in those endeavors will we influence the minds of men and women in other joint relations, and if, as a result of our further endeavors, the adjustments of wages and hours and collective representation can be brought about by calm discussion about a council table instead of by ultimatums between hostile camps, worthy then will have been our efforts.

The problem is most ably set forth by the President in his words announcing in a proclamation the signing of the armistice.

> We must ensure that what is presently to be built up is a new social order, based not on fighting but on fraternity — not on the competitive struggle for the means of bare life, but on a deliberately planned cooperation in production and distribution for the benefit of all who participate by hand or by brain — not on the utmost possible inequality of riches, but on a systematic approach towards a healthy equality of material circumstances for every person born into the world — not on an enforced dominion over subject nations, subject races, subject colonies, subject classes, or a subject sex, but in industry as well as in government, on that equal freedom, that general consciousness of consent, and that widest possible participation in power, both economical and political, which is characteristic of Democracy.

I have been reminded of that oriental fable from which we derive the expression—"And the phoenix arose from the ashes." As you probably know, the fable is that in ancient Phoenicia, from which the bird gets its name of phoenix, there is a giant bird of wonderful plumage and regal mien, probably not unlike our own American eagle. Shortly after its birth it goes forth into the world and through moral degradation its plumage is besmeared. It is buffeted and cast about until finally at the end of a hundred years, it comes flying back across the sea, a very forlorn object, not at all like its former royal self. It solemnly builds itself a funeral pyre and when the flame has reached its highest point, it flies straight into the center and by that act it is reborn again and comes forth the regal bird of old, its plumage reincarnated, glistening, and with the same lovely mien.

May it not be possible that our own American eagle is related to that phoenix and that possibly before the cleansing flame of war united us that our dollar chasing and our corrupt politics and our easy tolerance had somewhat besmeared and bedraggled the plumage of our emblem, and may it not be that through this cleansing fire through which we have just passed, our own good American eagle may be reborn and may rise again to new heights? God grant it may!

It is a rare privilege to me, presiding this afternoon, to introduce the speakers who appear on the program.

I wonder if you will pardon just an instant's diversion to personalities. Before I had anything to do with safety work, I had charge of the police organization of a large corporation, and there has come such an utter difference in the aspect of work in relation with people in general through the change of occupations that I like to refer to it because possibly it may help others to get just a little more out of our safety work than we realize sometimes is in it.

This incident happened almost at the end of my career as a police executive. A chap stole some brass and was caught in the act. The stealing of brass is very common in industrial concerns. He put up a pretty good talk and we decided to give him another chance. Our suspicions were aroused again, and he was able to establish his innocence, or, at least, we couldn't prove his guilt, and still another chance was given him. Finally, he was caught red-handed, stealing brass, the machine work of which had cost a great deal of money, and the part he stole was a spare part, which, if occasion had arisen to use it, and it had not been there, would have caused a great deal of disaster. He was stealing that for the price of a drink. I swore out a warrant and he was let out on bond, awaiting trial. He jumped his bond, and in order to play the game through to the end and follow all the rules, I followed him up and located him in Pittsburgh. He got wind of extradition proceedings and flew from there. Finally, we got him and sent him over. The day that he went to jail his wife came into my office and brought with her two little girls. She said, "Mr. Young, you have put my husband in jail; what are you going to do about us?" Up to that minute I had been pretty well satisfied with myself. I had played that game all the way through, first giving him his chances; he had refused them. The law had had its course and he had been sent over. The logical sequel of events had taken place. But what satisfaction was there when the wife and two children came in and said, "Now, what are you going to do with us?" We got him out of jail and he is as big a bum as ever. He never did reform.

On the day the trial was held, the case that preceded ours was one of a degenerate shoemaker. When I went home that night, I wasn't very well pleased with the proceedings, and my little boy asked me what I had been doing that day. I realized that in the work I was doing I couldn't tell him. The things I was doing didn't synchronize with the things at home; they didn't fit in. The next week the boss offered me a job as safety inspector. And that next week I went to the first Congress we had at Milwaukee.

Stopping accidents at an open-hearth furnace was the first thing I had to do. By showing a number of people how a number of accidents had occurred, there was finally evolved by the workmen themselves a device to prevent them. For a year and a half we went without a single accident.

Those were things that I could talk about. It all resulted in a common good, it was ennobling, and then I gradually began to realize, too, the character of men with whom it was bringing me in contact — men like those on your program, Mr. Little, Mr. Beyer, Mr. Rausch and others,— a little different from the men I had been dealing with before, and all the best in them being brought out.

A little over a year ago, when the Government had finally decided that "Safety First" was a good thing and one to be incorporated in all the great industrial establishments of the War and Navy Department, Mr. Little and our good friend Charlie Price were laying out the jobs that we had to fill, the places to which the safety engineers were to be appointed. One job in particular was a hard one; it was the only hard one, as a matter of fact. In a certain military establishment, the local commanding officer had been there a long time and the tide of "Safety First" had gone right past his door and hadn't affected him at all. He was somewhat of the old school and hadn't received Price and Little very well in their preliminary surveys. When finally the orders came from the War Department to establish the position of safety engineer, he wasn't at all pleased, and it was realized that the man who took that job would have to be a rare type of diplomat. It would involve tact and diplomacy. Mr. Little said, "We want a man who has the soul of a poet, the mind of a philosopher and the courage of a lion.

Do you know of such a fellow?" Price spoke up and said, "Yes, I do. He's a namesake of mine, way out in Montana. There is just such a man as you want." And they brought eastward Mr. James L. Price, of the Liberty Shipbuilding Company of the Emergency Fleet Corporation, United States Shipping Board.

HIGH PRESSURE SAFETY STANDARDS FOR LOW PRESSURE PRODUCTION

By JAMES L. PRICE, SAFETY ENGINEER, LIBERTY SHIPBUILDING COMPANY, PHILADELPHIA, PA.

Ladies and Gentlemen: There is a friend here in this audience with whom I consulted whether I should read my paper, or whether to speak as if it were an inspiration. He said to me, "Why, Jim, you're bad enough as a reader, as a speaker you're ——." I don't want to use the word here.

The topic was assigned to me "High Pressure Safety Standards for Low Pressure Production." I do not mean to say that we are arriving at the period of low pressure production; I believe it is going to be just the opposite, only our production will be directed towards peace instead of towards war.

Years ago, I read somewhere about a general maxim in philosophy to the effect that whatever exists must have cause for existence. As I began to prepare this paper, it occurred to me that this maxim could be made very well to apply to safety standards. In other words, since safety standards exist there is apparently a good cause for their existence. As a matter of fact, this maxim sounds especially convincing in the case of safety standards, for is not the word standard defined as a criterion of excellence? And what argument can there be as to whether or not anything that is excellent need be adopted? Such an interpretation, however, would automatically end this paper right here, and according to the program I am expected to take fifteen minutes of your time. Such being the case, I suppose I'd better forget about the maxim and give you my reasons why the safety standards which were given birth some years ago, and still further developed in the past ten months should be adopted everywhere.

I have made an attempt to confine this paper to the so-called safety standards as understood by the safety engineer, namely, standardized methods of safeguarding mechanical equipment and standardized methods of safe operation.

In order that you may see the advisability of applying safety standards today, in what your program maker is pleased to call the period of low pressure production, I shall give a brief outline of what has been accomplished by these standards in war time.

First a few words in explanation of safeguarding and safety standards as a whole.

There was a time when I had my doubts, even as some of you may have now, as to the desirability of safeguarding machinery to the extent standards called for. There may be among you some who feel as I felt some time ago, that if we make our plants physically fool-proof, the result upon the workmen or workwomen will be negative in its effect. You may fear, as I feared two or three years ago, that a completely guarded plant will create in the employee's mind a feeling of indifference to danger. He will reason that because everything is safeguarded, he himself need not exercise personal caution in the performance of the most ordinary work. I thought that by leaving a sufficient number of hazards exposed, I would train the workman to be on the alert. Such reasoning, however, is altogether wrong. I have come to believe that when I was arguing in such a manner I was unconsciously dealing in sophistries. I have come to recognize the fundamental psychological law that fear is only a transient emotion, and that is the reason why we must provide safeguards whenever possible. That is the reason we must not depend upon the man to think for his own safety while he is in the midst of dangerous surroundings. For no sooner does danger become a familiar mental reaction than it loses most of its potency as a warning and ceases to act as a reminder aiming towards self-preservation.

As to safety standards, you gentlemen are aware that in the past five or six years attempts have been made to standardize safety appliances and methods. These attempts were made by the larger industrial and public utilities corporations, by the National Safety Council and by various inspection and accident prevention bureaus. The reason for this desire to place safety appliances on a standardized basis is apparent at once. Were the generality of employers inclined to the idea that any kind of a policy, in so far as it had any bearing on accident prevention, was a good policy, it would be labor lost to suggest standards. Fortunately, employers of labor are men of affairs. As such they possess broad vision, and yet, are withal practical. It was realized at the outset that to issue orders to superintendents and to foremen, instructing them to safeguard machinery the best way they knew how, would in a good many cases lead to an orgy of expenditures. There were also to be considered the instances where the superintendents thought, because they never took the trouble to investigate the matter, that safety appliances were nothing else but new fangled ideas smacking of paternalism, half-baked theories of visionaries and sure forerunners of a finale in a court of bankruptcy. These gentlemen would have complied with such orders in a manner that was bound to be half-hearted. To safety it would have meant failure.

The men who are largely responsible for the place safety occupies in our industrial life, realized the danger to the movement of permitting haphazard methods in the practical interpretation of safety theories. They knew that if a safeguard or method were tried which would in the least interfere with production, the further development of safety in that particular instance was doomed. These men had to contend with the employer's inherent passion for output and to evolve means whereby humanitarianism, if you care to safety such a term, could be made a profitable investment. Only one way suggested itself to adequately solve the problem. Safety standards would have to be devised that would not merely safeguard the workman from injuries, but would also place the installation of safeguards on an absolutely scientific basis, leave no room for quibbling, be eminently practical and would furthermore increase the workman's personal efficiency and enhance his worth to the employer in dollars and cents.

Working on this principle, the prime movers in the safety movement went along quietly and have gradually developed sets of safety standards which

I shall not try to describe in a paper of this sort. Suffice it to say that they cover pretty nearly every phase of personal safety, fire prevention and sanitation.

The work of standardizing methods and safety appliances was beginning to show results when our country declared war against Germany. As soon as the United States joined the Entente Allies, it became at once apparent that the ultimate result of the conflict depended upon the proper husbanding of the national resources, and upon the most scientific application of modern business methods in the utilization of the country's industries. Such a policy as applied to safety meant that accident prevention measures would have to be turned to the highest possible degree. Pre-war conditions had already demonstrated clearly how production depended upon safety. They proved that production and quality of output are directly affected by the morale of labor, and we all know that a comprehensive safety campaign is the best vehicle for promoting mutual understanding and bringing about good results and good feeling.

To maintain then the efficiency which existed in the pre-war period, and if anything to accelerate production and to improve the quality of the output, it was reasonable to suppose that methods which were successful in peace time would also prove their worth in war time and should be exploited to their utmost. When our industries were placed on a war basis, mobilized, if you please, the men who were entrusted with the task of bringing about 100 per cent efficiency in our production were also the men who were entrusted with the sponsorship of the movement in the pre-war years. At all times they watched with keen interest the subsequent growth of the movement in their respective spheres. It was but natural that they should encourage its extension to the industries they were called upon to direct and manage during the trying months when output was a matter of nationally vital importance.

The War Department and the Navy Department, the two branches of the administration that were most concerned about getting things done and getting them done quickly, were also imbued, because of their associations, with the spirit of getting things done safely. Safety engineers were detailed to the manufacturing establishments of the two Departments. These safety engineers, working under the inspiring and compelling direction of our friend Mr. Young, then Director of the American Museum of Safety, as well as the chief Safety Expert of the United States Employees' Compensation Commission, decided that the most good they could do would be to complete the work of safety standardization so ably begun by the various bodies mentioned above. Advised by the National Safety Council, and assisted by some of the best safety engineers of the Emergency Fleet Corporation, representatives of the United States Bureau of Standards and the Bureau of Mines, and managers of the National Workmen's Compensation Bureau, they further developed the standards and began to introduce them into the Federal industrial establishments as well as into the Government controlled industries. The commanding officers and works managers when approached by the safety engineers proposing the adoption of the safety standards sensed their usefulness and economy. Here, broadly speaking, they had concrete suggestions aiming to safeguard workmen from personal injury and themselves from all the inconveniences (and I am using a mild definition as you will agree) attending an industrial casualty in the plant. The safety standards were given a trial, and as soon as their practicability was proved, instructions were issued that operations conform to them. If, at times, the actual execution was somewhat slow, it was due to the inability of obtaining either the necessary material, or else help was at a premium.

While in the matter of insisting upon safe practices, discipline had to be, at times, relaxed on account of the difficulty in dealing with the human factor in war time when the demand for labor was out of the ordinary.

Looking back we can say with decided assurance that safety standards made good. They made good at a time when production was the leit motif in our national life. They made good at a time when the cry of the hour was more guns, more ships, more shells and more powder. They made good at a time when the safety of our nation, when the safety of the allied nations depended upon the launchings in our shipyards, the production of our factories, the output of our mines. Is it an exaggeration to say that any theory or any idea that survived the merciless test of war time stress justifies its existence in peace time when minds are calmer, when the demand for output is more reasonable, when the problem is no longer a question of winning or losing the war, but a matter of economics pure and simple?

The safety standards in vogue today present the result of profound research by men who have devoted years of intense study to the subject. These standards express the best thoughts on applied safety mechanics simplified and systematized to the highest degree possible. The underlying principle in safety standards is to give the manager, who believes, or at least suspects, that safety pays, an opportunity to get away from costly experiments, from amateur theories, from inadequate safeguards. They are intended to help the manager, who, immersed in his daily routine work, has no time nor inclination to bother with what after all is detail to him. Experience proves that it is not advisable to leave the matter of safeguarding the workmen to the individual policies or theories of the average superintendent or foreman. Safety standards aim to do away with confusion, friction and things done poorly that should have been done well.

The safety standards as they are now developed and being put in shape by the United States Bureau of Standards have been carefully studied out. If conscientiously applied, they will have a tendency to gradually diffuse throughout the plant an atmosphere of orderliness, thoughtfulness and advanced methods. The moral and psychological effect of standardized methods upon the superintendent will lead to thinking of his work in terms of standards. The foreman will begin to believe that safety is truly a part and parcel of his employer's plant policy. In the workman it will be conducive of great mental discipline, more regularity in attendance, and I am sure, will eventually bring about a more frequent exercise of personal caution in the performance of his work.

Mr. Young: When Abraham was running for re-election, one of his homely phrases was used with telling effect by his political advisers. It was that it was inadvisable to swap horses in the middle of a stream. A few months ago the nation was rather convulsed with laughter at another Illinoisan's remark about the desk soldiers in Washington and the statement that they wore spurs so their heels wouldn't slip off the desks. Everybody laughed at it and unconsciously we did a great wrong. The enlistment of men in non-combatant branches became after that, to my mind, just a little finer display of heroism, and I mean no disrespect to those who have given their lives in the conflict, but I say that after that criticism those men who have gone into the non-combatant forces and encountered that little sneering odium, which might sometimes be attached because of the socalled funny jokes that were made, displayed a little truer and finer heroism when they knew that their services contributed to their country in those positions would be more efficient than answering the call of the bugle and the fanfare of the trumpets.

One of them who did that was Mr. Reilley. At that time, Mr. Reilley was working as a special agent in bringing safety to pass in Government controlled establishments. It was thought advisable by the War Department to have commissioned officers in that field and, therefore, Mr. Reilley became Captain Reilley and is working as the representive of the Ordance Department in those manufacturing establishments which have been under Government contract.

He is peculiarly fitted, as a result of that experience, to tell us more of the possibilities of devoting to our peaceful reconstruction program the efficiencies and the refinements which were made possible through the concentration of effort on the war program. I take pleasure in presenting to you Captain Reilley.

SAFETY WORK IN WAR AND PEACE

BY CAPTAIN A. D. REILLEY, ORDNANCE DEPARTMENT, U. S. ARMY

CAPTAIN A. D. REILLEY: I see that I am on the program to discuss Mr. Price's paper, but in his very first sentence he took care to shut me off, because I don't see how you are going to discuss an axiom. It is probably just as well because one gets a little out of the habit of talking when in the Army— even desk soldiers.

There was a time when on one occasion I could have been a General by saying two words. I was down in El Paso, Texas, and they told me that if I would walk across the bridge into Mexico, stand in the public square and holler "free beans," I would be a General. You see I haven't any star. One look at the Mexican army was enough.

We have passed through a period of tremendous stress in all our manufacturing establishments, and those men who have been engaged in safety work in those plants which were working on Government contracts have learned some things which are going to be of incalculable value to them. In the first place, our previous training had taught us that working conditions, good working conditions, in a factory, both of safety and sanitation, were aids to production the value of which it was impossible to estimate. We went into this movement for the Government with that idea strongly in our heads, and I want to say that nothing has happened during this war period that hasn't driven in still more firmly that same idea, but there has been a problem which every safety engineer, in every plant in which there has been one, has had to face. It wasn't just production that had to be accomplished; it was emergency production. We had to have war material, but we had to have it *today;* tomorrow wouldn't do; tomorrow Hindenburg's Huns might be thundering at the gates of

Paris. The safety engineer had to face that in every single case; he knew — we all knew — that to improve the working conditions in every factory that we could would increase production, but we had to solve the problem — would it delay production *today?* The problem probably wouldn't have been difficult to solve had the labor market been overflowing and material been abundant and easy to get, but those factors didn't exist. Labor was scarce and material was scarce and transportation was difficult. Consequently, every safety engineer has worked under that double handicap. Therefore, he has learned more during this period of stress when he has had to work under a handicap of that kind than he would have learned under ordinary times when everything probably was going smoothly.

In the reconstruction program, it would be foolish to think for an instant that the vital need for production will be lessened in any way. Europe has been on a war basis for four years. We were gradually approaching (I think I am hazarding this fact) 100 per cent war preparation in this country. Europe's peace industries, and to a certain extent ours, showed, necessarily, deterioration. The rebuilding of industrial Europe and the rebuilding of the industries of the United States will demand a production that is quite as vital at this time as during the war. The only difference is that we probably have a little more time in which to do it.

All the things that we learned during this war period we can put into operation and help production by bettering working conditions in every spot where we find them. I know that I have always found in my experience that good working conditions make a low labor overturn and poor working conditions make a high labor overturn, that is, eliminating a certain class of peripatetic labor which you find practically in all plants — come to-day and leave tomorrow — especially in times when there is a job around every corner. Eliminating all those special factors which will make a fair sized labor overturn on any employment books, you will find that labor is more constant in a factory where there are good working conditions than in one where there are poor conditions. I have never personally known it to fail. All that aids production, aids immediate production, aids production over a long period of time.

Generally speaking, we have not (when I say "we," I mean officers in the Ordnance Department in my own particular branch) approached this subject from any other standpoint but the standpoint of production. With the manufacturers it is a profit and loss problem — whether they will win or whether they will lose by good working conditions and by a well thought out safety problem.

I have had little contact with this. I can only discuss it from the standpoint of its effect on production because that has really been my only interest in it.

There are two thoughts that come to me in relation to this safety campaign during the next few years. I was very much pleased to hear this morning the rather vigorous discussion on the subject of a campaign of education. It is opportune to point out in just one way that now is the time for a campaign of education. After every great international emotional convulsion there is a reaction. Europe for four years has had an orgy of blood. Now the powers of darkness are safely shackled and cast into the bottomless pit. We have not been confronted with the horrors of war to the same extent that Europe has, but nevertheless, we have been somewhat permeated with the same emotion. That reaction is coming, it is bound to come, it will be here shortly, and for the next ten years this world will be tenderer of human life than it has for fifty years past. Every campaign of education that tends to spread the gospel of conservation of life and limb is going to have sympathetic audiences.

Out of the work that has been done in Washington several organizations have developed. I don't know that their work is as necessary in a state like New York with its very highly organized factory inspection department as it would be in some other states where the organization is not so well perfected. Nevertheless, there is no spot where a highly organized, well-equipped, well-balanced organization for industrial betterment can't make itself felt today. The Public Health Service has established a branch known as the Division of Industrial Hygiene with a distinct organization throughout the United States. That particular organization strives to have a balanced district organization in each place. In general, the head is an industrial physician. There are safety engineers on the personnel — industrial health men, fume and gas and dust men, ventilating engineers, analysis men. They are at the call, absolutely free, to any manufacturer who wishes to use their services.

That is just one that I mention. There are several others in Washington that have developed out of the industrial stress occasioned by this war. All those organizations can be used for the campaign of education. States like New York, New Jersey and Pennsylvania are conducting their own campaigns and I have no doubt that they will take advantage of this opportunity to increase the scope of their work.

There is one more thing that I think we need very badly. I have found in my experience that it was almost the hardest thing to get — that is the safety engineer. There seems to be an awful dearth of them. We constantly urged every plant to appoint a safety engineer and make a safety organization and our constant answer was, "We can't find one. Dig us up one and we will hire him." We did dig up some, but not as many as we wanted.

I am a little afraid of the term "safety engineer" after the discussion this morning. I will explain that I am using it in a generic sense. I am perfectly willing myself to go on record right here as saying that the greatest safety engineers I have ever met have not had university education. At the same time I also want to say that I can't for the life of me see how a university is going to hurt him. I think that if you get two men, one trained in the school of hard experience and the other with a university education, with all other mental qualities alike, you will find it is a case of fifty-fifty.

I am reminded of the story of the southern planter who was going to drive to town one morning and found his old negro servant waiting at the horse block. The old colored servant said, "Massa, is you goin' to town?"

"Yes, Sam, I am."

"Well, Massa, would you do sumpin' for me?"

"Sure, Sam, what is it?"

"While you is dere, you get me a marriage license."

"Why, yes, Sam, I'll get you one."

He drove to town, got through with his other work and went around to the license clerk. When he got there, he suddenly remembered that Sam hadn't told him the name of the lady, but he thought he knew where Sam's affections were centered and so he had the license made out in the name of Sam and Lucinda. When he got back home, Sam met him and said, " Massa, did you get me that marriage license? "

" Yes, Sam, I got it. But you didn't tell me who the lady was. Anyhow, I thought I knew your feelings toward Lucinda."

" Lawd, did you get that in Lucindy's name? "

" Yes. Wasn't that right? "

" Naw, suh! I done lost all my taste fur Lucindy."

" Well, Sam, you should have told me."

" Yes, suh, I know, but can I get another one? "

" Yes."

" Well, what I wanta know is how much this one cost."

" It cost $1.40."

" What'll it cost to get it changed? "

" It will cost you $1.40 to get another one."

" Lawdy, there ain't no $1.40 difference in them two niggers; I'll take Lucindy."

I don't think it is necessary to apply that story; I think you see the application. At any rate, we need those safety engineers and we need them badly. We couldn't find as many as we wanted during the war.

The courses that are being established in our universities will do something to advertise the necessity for them, as well as to give them training, but it needs a lot of preaching and lecturing. Young men want to have it suggested to them to go into safety engineering as a profession, to pick it out and go into it and deliberately take it just the way they take law and medicine and civil engineering and anything else, because I believe that in the future one of the most important officials of the plant, if not *the most* important official, is going to be the safety engineer.

As I said before, men in uniform aren't really expected to talk a whole lot, so I am not going to take up your time very much more. If I did, I would be liable to get into the plight of that clerygman who arose in his pulpit one Sunday morning and said, " My dear hearers, this morning we will first take up and discuss the major prophets." And he preached for three-quarters of an hour and said, " Having by these few brief introductory remarks disposed of the main portion of our subject, we find ourselves free to take up the minor prophets." Then he preached for about an hour and a quarter. Then, at the end of that time, he said, " But what place shall Jeremiah have? " And a voice came from the back of the audience — " Jeremiah can have mine; I'm going home."

One thought that I want to leave is — for the love of Heaven, please press that campaign of education and in the second place, *make* safety engineers; you can because it is a good career and a good profession.

Mr. Young: I wonder how many of you have read in this afternoon's paper the remarks of Mr. Rockefeller at the Atlantic City Conference in which he proposes a constitution for labor. We have constitutions of almost every organized activity in life except the relation between capital and labor.

It has never been reduced to constitutional form. This bears directly and synchronizes absolutely with our experience and our plans in safety. Mr. Rockefeller talked of labor and capital meeting changing conditions and of partnership without being forced to it being advocated.

An industrial creed for the four parties to industry— capital, management, labor and the community — was outlined by John D. Rockefeller, Jr., in emergency and reconstruction conference in session here.

Asserting that capital and labor are partners with common interests, and not enemies, Mr. Rockefeller stated ten tenets of his industrial creed. These included advancement by industry of social as well as material well being of employees; opportunity by employees to earn a living under conditions of fair wages, reasonable hours and proper industrial environment; reward for initiative and efficiency; machinery for uncovering and promptly adjusting grievances; adequate representation of all the industrial parties with annual joint conferences to assure industrial harmony and prosperity in each plant with this system extended to include all plants in the same industry, all industries in a community, in a nation, and in the various nations.

This is an extended article which will bear your attention.

I sought for adjectives with which I might portray Mr. Forster to you and all the superlatives failed me until at an opportune moment there was thrust into my hands a little magazine which had an introduction, offered by a negro minister at a Baptist convention in Alabama, of one of the steel magnates who was present and spoke a few words. What the minister said is not, even as he said it, sufficiently complimentary or sufficiently fitting to introduce Mr. Forster, but I offer it as a small effort toward that end.

> " Some men are born great, some achieve greatness and some have greatness thrust upon them." I have the honor to introduce a gentleman who has achieved greatness. A man of intelligence and a man of integrity. A statesman and a reformer. A leader of leaders. A man whose reputation is as spotless as a star. A man whose career is as clear as a crystal. A man who is big enough to handle large affairs, and yet little enough to be reached by the humblest worker in the plant. A man who possesses the grand combination of heart, conscience and brain. A champion of right, a master, a winner, who knows no defeat. An optimist of optimism, who meets the lion and conquers him, who meets Goliath and conquers him, and if he meets the Kaiser, will conquer him.
>
> Like the sun he moves in his own orbit, but imparts heat, light and inspiration to his most distant satellites. By instinct men trust him. " None know him but to love him, none name him but to praise."
>
> He is unique in his character, but majestic in his individuality. He is bold without rashness, constant without obstinacy. He puts caution against hope, lest that hope becomes premature, and hope against caution, lest that caution leads to greater danger. He is both solid and brilliant. His self-abnegation finds its highest expression in the welfare of humanity. His inspiration emanates from immortal duty, leaving at an immeasurable distance all personal interest and feeling.
>
> His soul is animated to deeds of sacrifice and devotion for the good and glory of humanity.
>
> I take great pleasure, therefore, in introducing to you the incomparable diplomat, the superb financier, the industrial colossus, the sage and the seer, the wizard and the wonder, Mr. Forster.

BUSINESS CONDITIONS AND THE LABOR SUPPLY AFTER THE WAR

By H. W. Forster, Independence Inspection Bureau,
Philadelphia, Pa.

Mr. Chairman, Ladies and Gentlemen: It is going to be difficult for me to talk to you in a serious vein after this humorous introduction.

As you will observe on your program this afternoon, I am to talk on "Business Conditions and the Labor Supply After the War," and at first glance it might seem that there is no proper place upon this program for that subject. It has been placed last. I hope not because it seemed most insignificant to the program committee, because it has a very vital bearing upon your problem.

The biggest problem before the country a month ago was national team-work to win the war. The biggest problem before the country today is national team-work to restore the country to approximately a normal industrial basis, and to do this with as little as possible stress and financial disadvantage to workers, employers and the national Government. In the time given me, I shall attempt to present my conclusions as to the business and labor conditions ahead of us, and also as to the place which a modern industrial relations policy will have in American industry. In giving consideration to the subject I have done so under the four principal heading of:

(a) Possibilities of a business depression.
(b) The business that America can do.
(c) The labor that will be available.
(d) Relations of management to men.

Possibilities of a business depression.—A business depression or a panic, if the situation becomes acute, is generally due to one or a combination of the following factors:

1. Over-production.
2. Unwarranted speculation.
3. Lack of confidence in the situation by the financial interests.

The only factor in the situation that might be said to fall in the over-production class is the direct munitions producing business. The cutting down of this, according to all indications, will be gradual, and as it has been built up at the cost of normal activities there seems to be no element of serious danger in a gradual turning of capital and labor from production for destructive purposes to production for constructive purposes.

The element of speculation which was very prominent approximately a year ago has been decreased to the point where it is not a sufficient factor to be responsible for any appreciable business upset. The buying of enormous amounts of Government securities, coupled with the attitude of the money-lending interests, safeguards us most effectively against dangerous speculative proclivities.

While it has already been a month since the successful ending of the war was assured, and while there has been nothing resembling a general lack of confidence in the situation, it is in a lack of confidence in the situation that there lies whatever danger confronts us along the lines of a business depression. The transition from a war to a peace footing is being accompanied by a considerable number of difficulties and strains, and hence a lack of confidence, by employers, financial interests, and the Government authorities, can work to the material detriment of the country as a whole. It is my belief, however, that the opportunities for American industries which are opening up before us are so wonderful that all our legislative and financial interests will see the value of economic team-work, and that American business will be given the reasonable help that it may need to get over the adjustment period and to participate actively in the big work that needs to be done.

The business that America can do.— The work that needs to be done and the opportunities that lie before the United States in the period after the war comprise primarily the following:

1. Carrying on our normal peace time activities in all of their ramifications, and substantially on the same scale as before the war.

2. Catching up on our delayed normal activities, some of which have lagged perceptibly since 1914. Our public works, building construction, including hundreds of thousands of dwellings, and our debilitated railroads are cases in point. Practically all stocks of goods are low.

3. Producing smaller, but nevertheless enormous, quantities of military and naval supplies for our forces that will be slow in disbanding, and that will probably remain larger than ever before. Incidentally, it is reported that the Government proposes to have produced and to store as a measure of public safety enormous quantities of military and naval supplies.

4. Engaging in numerous activities new or largely augmented since the war, such as the production of aeroplanes, of dyes and chemicals, and the building and operating of ships.

5. Helping reconstruct devastated Europe and re-equip in part all of the partially exhausted belligerents. This we can do out of our abundant raw materials, with our varied and efficient industries, and by virtue of a financial strength that will enable us to lend generously for reconstruction purposes and to divert much of the loaned money to American industries. This war has unquestionably taught us enough thrift to enable us to continue to be a creditor nation on a gigantic scale.

To sum the matter up, the world has its normal activities to re-establish, enormous damage to repair, heavy tax burdens to carry, and to do all this with a reduced man power. It is certain that the United States, by virtue of its resources, the capacity of its people, its wealth, and its lending ability will prosper as never before.

The labor that will be available.— Except in occasional intervals of depression, none of which have given the country a serious set-back, the United States has been able to employ profitably not only all of its own population, but millions of foreigners who have flocked to our hospitable shores. The loss of the latter labor, coupled with the unusual demands of a war, produced a serious labor shortage which affected adversely our military operations and practically all of our essential nonmilitary activities. Today there is no excess of labor, speaking generally, in spite of the war termination and the cessation of much war supply production.

In an attempt to determine whether labor is likely to continue scarce after the close of the war, or whether the conditions will be relatively easy, I have given consideration to certain factors and have attempted in a very rough way to evaluate them.

Adverse labor supply factors.— Under this heading come primarily the following:

1. The slow return of our soldiers and sailors. It is evident that it will take something like a year to return to civil life all those not needed for military service abroad or at home.

2. The loss through death of upwards of 50,000 of our military and naval forces.

3. The complete or partial incapacity of a reasonable number of our soldiers and sailors.

4. The certainty that quite a number of our over-seas forces will settle in France and other European countries.

5. The likelihood that our military and naval establishments will for a considerable time be far greater than before the war, withdrawing much of our best man power from industrial life, and requiring the diversion of a proportionate amount of industrial capacity for their support.

6. The loss of approximately two million immigrant workers during the past four years. Our immigration was reduced about three million persons below the before-the-war figures for a corresponding period of time, and about two-thirds of the immigrants are workers.

7. The almost absolute certainty that patriotic impulses, legal restrictions, and economic advantages offered foreigners at home will largely reduce immigration after the war. Incidentally, the United States has stiffened its immigration requirements, and there seems to be no sentiment in any quarter to offer the United States as an asylum to unfortunate European citizens. The old fear of the lower living standards of foreigners affecting disadvantageously our workers who live on a higher plane is once more being voiced.

8. The certain loss, temporary in many cases but permanent in others, of foreign born workers who plan to return to their countries upon the restoration of ocean travel. How large the number will be is purely a matter of conjecture, but that the number will be large is certain. Enormous numbers of passports are being requested, and many steamship bookings are reported to have been made. In one plant employing approximately 10,000 foreigners, 5,300 signified in writing their purpose to return to their home countries as soon as possible. The United States probably cannot throw any restrictions in the way of citizens of foreign countries returning home on ships of their own nationality. The United States probably would not do so if it could, standing as it does for the maximum of individual liberty of action.

9. The necessary withdrawal from other forms of industry of the large number of workers needed in our new or largely extended industries. For example: We own more ships than ever before, we are building them at a rapid rate, and every one will be operated to full capacity and probably largely by American seamen.

10. The unwillingness of many former workers of the common labor class, who have been partially trained in war industries, to return to a lower grade of work and probably to a correspondingly poorer scale of living. This should have no appreciable ultimate effect on our labor supply, but it is likely to complicate matters at the outset and to make it difficult to secure the necessary common labor for many of our more important industries.

Advantageous labor supply factors.— Under this heading come primarily the following:

11. The entrance into the industries of a considerable number of women, who, almost without exception, have made good in a large number of fields of activity. Possibly a million additional women have gone into our industries in the past few years, of whom it is fair to expect that a considerable proportion, possibly half, will withdraw. Some have left, or will leave, because the emergency is over. Many will leave as large numbers of our marriageable men return from overseas.

12. The increased efficiency brought about by the adoption of labor-saving devices, the specific training of workers, the incentives given workers to produce large quantities, and the withdrawal by organized labor of restrictions on production by its members.

13. The increased efficiency which our soldiers and sailors will possess when we finally get a large number of them back into our industries. The actual training which these men have received, their increased physical stamina, their appreciation of the dignity and the results of hard work, and of the value of obedience to constituted authority will be one of the most valuable benefits of the war.

In the following tabulation, it has been attempted to evaluate the factors just discussed as of a time approximately a year from date, and to establish their effect on our industrial life as we were conducting it prior to the war, so that the man who is identified with an old line industry may see what his outlook is for his particular business or job. These figures in part are pure assumption on my part, and can be claimed to have value only in so far as they show the trend of the labor situation.

		Estimated	
	Debit Items	Minimums	Maximums
2–3	Death and complete incapacitation of soldiers and sailors	75,000	100,000
4	Soldiers and sailors settling abroad	50,000	100,000
5	Larger army and navy	250,000	500,000
	Increased industrial capacity required by larger army and navy	750,000	1,500,000
6	Loss in immigrant workers during last four years	2,000,000	2,000,000
7	Loss in immigrant workers during next year	250,000	500,000
8	Return of foreign born workers	500,000	1,000,000
9	Needs of new industries	400,000	600,000
		4,275,000	6,300,000
	Credit Items		
11	Permanent accession of women	250,000	500,000
12	Increased efficiency of women (12,000,000, at 5% and 10%)	600,000	1,200,000
13	Increased efficiency of soldiers and sailors (3,000,000, at 10% and 20%)	300,000	600,000
		1,150,000	2,300,000

These figures indicate a shortage to which our normal pre-war industries will be subjected about a year from today of from two million to five million workers. No matter how far from the mark the figures may actually be, they indicate definitely that American employers cannot look forward to an easy labor situation.

As just stated, this labor forecast is intended to cover conditions about a year from date, by which time the soldiers and sailors who are to be released from service should be back in civil life. During the next year, many men, in addition to the ultimately larger army and navy will be in the service, and their support along lines of food, clothing and other equipment will take a very considerable amount of industrial capacity. This will appear to make probable a labor shortage during the next year greater than that of a year from date, but the likelihood is that the fact that our industries are demobilizing rather slowly and that we will continue to have a considerable number of women in our industries will tend more or less to balance the situation.

This whole estimate is based upon the assumption that business in the after-the-war period will be equal to that prior to the war. If the business is to be far better, as I firmly believe, the labor scarcity will be even greater, and even the influx of a lot of foreign born labor would not swing the pendulum of labor supply in the opposite direction.

Relations of management to men.— It is evident in view of the foregoing that the employer should view his present working forces as a tremendous asset, should make every effort, if he faces a difficult transition period, to retain at least the best part of his forces, should handle them with all the consideration and managerial skill of which he is capable, and, speaking generally, should strive to apply to his labor problem everything which experience in the industrial relations field has crystallized into good sound practice.

The war, with its resultant shortage of labor and labor unrest, has tremendously emphasized the economic value of a good industrial relations policy, intelligently and vigorously carried out. This has been even more true in Great Britain than in the United States, where before the war there are reported to have been less than a score of plants with well organized employment and service departments, and where there are now well over 500. Progressive managements now recognize stable, efficient and loyal workmen as a tremendous asset. They know in a general way the dollar value of their working forces, and they are willing to spend generous sums of money to make their workmen steadier, more efficient, more prosperous, and healthier and happier than formerly. And I think that the attitude of at least the thinking element among the workers toward the employers is materially improved also. I look forward to a new era of mutual regard and trust, of industrial team-work, and of joint prosperity greater than in any time in our history.

If the Government continues to so large an extent to control labor, it is certain that labor will receive generous consideration in the matters of wages, hours and other essential factors.

If the Government control of labor is withdrawn, and if the labor supply is relatively scant, labor will be in a position with great likelihood of success to bargain for generous treatment at the hands of the employers. Roughly speaking, there is nothing which the Government, organized labor, or employers can do to counteract the operation of the law of supply and demand.

The assistance of the United States is so badly needed in reconstruction matters abroad that foreign nations will have to buy certain products such as food, agricultural implements, rails, locomotives and cars, from us for a considerable period of time, even if our production costs and selling prices are materially above those of our European competitors. The fact that European nations will borrow from us and that the borrower can specify where the money shall be expended, as witness our war credits to our Allies expended here for munitions, is an additional factor that will insure to us a generous share of the reconstruction program. Wages in foreign lands also have been much increased, but according to all reports ours are far higher than in any allied or enemy countries. However, I believe it would be possible for a reasonable period of time, such as one or two years, for us to pay very high wages, almost irrespective of what wages are paid abroad.

If the United States decides to wall itself in with a tariff high enough to balance the difference in production cost at home and abroad, I presume that we can continue to maintain practically the same wage conditions as at present, if not in actual dollars, at least relative to the cost of living. If, however, the United States desires to become a big factor in foreign markets, as seems most desirable, and in fact almost unavoidable, it is obvious that our costs and selling prices must approximately equal those of our competitors. That means a reduction in cost, that in turn calls for a reduction in wages; that will mean also a reduction in profits. A reduction in wages can take one of two forms; either a reduction in earnings where the normal amount is produced by a man, or the approximate maintenance of present earnings by virtue of increased production, and consequent reduction of the unit cost.

Never before, so much as now, have employers and workers seen the mutual advantage of increased production. Truly wonderful results have been achieved in the past year or two. Big pay and big profits have resulted. Men have not become physical or mental wrecks because of "speeding up." What has happened is that a part of the slack in industry has been taken up. The effect upon the individual worker has been comparable to the effect of intensive army training on his brother in the service. How good that effect has been every one knows. American workers have done more useful work, earned more money, lived better, saved more, and altogether are more useful and self-respecting citizens than ever before. Through the educational facilities afforded them in industry, tens of thousands of men and women have become skilled workers or more skilled workers, just as in the army men have been taught trades that will stand them in good stead for life. I hope that never again in America will there be any organized effort to curtail production. To guard the health of workers, to safeguard them in their working places, to see that men receive adequate pay for what they do, to insure them just treatment, is most desirable, but to restrict production in the belief that it is an advantage to a specific group of workers is to follow after false economic gods; to apply the principle to the country as a whole will spell industrial suicide in an international sense.

The hope of the world politically, industrially, morally, lies in education. The hope of the worker lies in education, education that will teach him the principles underlying his work, show him every practical short cut, aid him to be a producer in a big way, and only by a general recognition by employers and workers of the tremendous advantage of industrial team-work, of which a comprehensive educational plan is a vital part, will America be able to hold the place in the affairs of the world which she has won through the blood of her soldiers and the sweat of her workers, and life for her citizens will only then approach the ideal which this great and glorious country should make possible for its diligent citizens.

GENERAL DISCUSSION

Mr. Young: There have been two or three requests as to a continuation of the arguments and the discussions of the morning's session. They may not be continued this afternoon. I think, if there is to be any discussion, that Brother Forster has thrown bones enough to the dogs to get considerable growling out of the pack. The subjects for general discussion this afternoon are now open for informal discussion. A few rules will govern the conflict — if any. You will be allowed three minutes to make your point — not more, unless you get the unanimous consent of those present. The referee will be the time-keeper. Are the fighters ready? Take your corner; are you ready? Set — time!

Mr. William Purcell, Factory Inspector, State Industrial Commission: I'd like to ask Captain Reilley what the United States Government is doing in regard to vocational training for the war cripples, and how many they are going to take back into the United States Government industries, such as shipbuilding, the army, etc.

Mr. Young: Wasn't that pretty well covered by the rehabilitation program yesterday?

Captain Reilley: I saw Colonel Mock's name on the program a little while ago. That is in line with his job.

Mr. Young: He was not available, Captain Reilley.

Captain Reilley: I really don't know; I have had nothing to do with it.

Mr. Young: Is there any further discussion or any extension of Mr. Forster's remarks?

If not, it becomes my duty to turn the Conference over to the President of the Third Industrial Conference, Commissioner Lynch.

I think it would be in order to entertain a motion, before the Commissioner takes the chair, expressing the appreciation of the audience and the people who have attended and have had the opportunity of getting together and hearing the papers which we have had, and some appreciation of the progressive attitude of the New York State Industrial Commission. It is the only State in the Union in which just such fine Congresses as these are being held under State auspices.

MR. J. E. CONNELL, Safety Inspector, Franklin Mfg. Co., Syracuse: Mr. Chairman, I desire to move you that this Congress extend a vote of thanks — a rising vote — to Commissioner Lynch and also the visiting delegates who have come to our city. Carried.

MR. YOUNG: Mr. Commissioner, the meeting is yours.

COMMISSIONER LYNCH: I assume, of course, that the intent of the mover of the resolution was that the expression of appreciation should be extended to the Industrial Commission, of which I happen to be but an humble member.

Just a few words, and then we will adjourn the conference.

When the Industrial Commission determined to hold the First Industrial Safety Congress, they approached the task with a great deal of fear as to the outcome, but nevertheless, preparations were made and the Congress convened two years ago, and while it was not as great a success as it was hoped, still it was a success, and the Congress last year was still a greater success. The exhibits of the First Congress were not numerous in number, but last year the hall was filled, and this year, as you know, the exhibits have been very fine, indeed, and the Congress this year has been everything that was hoped for by the Industrial Commission. The papers read have been finely prepared and the discussion has been intelligent and to the point, and so the Industrial Commission is well satisfied with the results that it has achieved by holding these Congresses annually, and I believe that I can now state that the Commission will within a short time announce its determination to hold a Fourth Industrial Safety Congress.

You may have noticed that the Industrial Commission itself took very little part in the discussion this year, partly because it was unnecessary and partly because the Commission desired it to be *your* Congress. At the first two sessions, more or less participation by the Commission was necessary to start the discussion, but this year that has not been necessary and we trust it will not be necessary again and the Fourth Congress will still be your Congress and the Congress of the people who are directly interested in this safety movement, the manufacturers of the State and their employees.

On behalf of the Industrial Commission, I desire to return its thanks to the Mayor of Syracuse for his address of welcome; to the Committee on Program arrangements, the names composing which you will find on the first page of the printed program, for the work they have done in preparation for this Congress, work that has extended over the better part of a year. It is not a simple task to prepare an entertaining program, a timely program and a pertinent program and secure speakers who are able to discuss the various subjects, but we have certainly succeeded in doing that this year, and I think special commendation is due to the Chairman of the Program Committee, Mr. Mark A. Daly. The Commission desires to return its thanks to the speakers, the ladies and gentlemen who have read papers during the four days' sessions and also the discussers of those papers; to the Committee on Exhibits for preparing that very instructive and useful exhibit that you have seen at the Onondaga, and to the exhibitors who took part in making that exhibit a success; to the Onondaga Hotel for the use of the ball room for that exhibit. The Committee desires to express its special appreciation to Mr. E. H. Fiesinger, who was in charge of the Local Arrangements Committee, who engaged the soloists and the orchestra and who arranged for the decorations here and at the Onondaga Hotel; to the vocalists for their services and to the orchestra for the beautiful selections rendered; to the Chamber of Commerce and the Manufacturers' Association for the money that was necessary to defray these local expenses and which the Industrial Commission did not have for that purpose; to the Syracuse newspapers for the very large amount of space that they have devoted to the proceedings of the Congress, and, therefore, to the propagation of the work for safety; to the attendants, many of whom have come from distant parts of the State, for, after all, it is the audience that makes the play successful, and the audience has played a very prominent part in this Third Industrial Safety Congress, and I am sure that if you have been educated and instructed, you will be willing to go out promoters of this safety movement, applying practically the lessons which you have learned here and also advertising these Safety Congresses and urging the great value of attendance at the future sessions of the Congress.

This safety movement has just begun, notwithstanding the vast amount of work that has been done in it. It requires very much education, hard work and continued agitation to carry it on, and if it is not continually agitated, then it would shortly become non-existent. This safety movement must be continued, and the Safety Congress is one of the methods of carrying on this great movement of the conservation of human life and human limb. You who attend here, it seems to me, have a duty to perform as well as the Industrial Commission has its duty to perform in carrying on this good work and making it greater and greater each year in its results.

If there is nothing else, we will declare this Third Industrial Safety Congress adjourned for one year.

EXHIBIT

The exhibit of safety devices, which is an important feature of the Safety Congress, attracted a large number of interested visitors.

The list of exhibitors included the following firms, corporations and organizations:

F. A. Garlton.
Chesebro-Whitman Co.
F. A. Hardy & Co.
Kaustine Company, Inc.
Life Saving Devices Co.
Page Steel & Wire Co.
Buffalo Wire Works Co.
Stonehouse Steel Sign Co.
T. A. Willson & Co., Inc.
Sweet-Orr & Co., Inc.
The Strong Kennard & Nutt Co.
Utica Mutual Compensation Insurance Corporation.
Utility Garment Company.
American La France Fire Engine Co., Inc.
Shur-Loc Elevator Safety Co., Inc.
The Stier's Corporation.
Finola Manufacturing Company.

Square D. Company.
Glauber Brass Manufacturing Co.
H. W. Johns-Manville Co.
Controlled Companies of American District Telegraph Co.
Lewis Safety Guard Co., Inc.
W. H. Sylvester & Son.
Walter Soderling, Inc.
Clipper Belt Lacer Co.
The H. D. Lee Mercantile Co.
Safety Engineering.
The American Museum of Safety.
The Trumbull Electric Mfg. Co.
Bureau of Women in Industry.
American Mutual Liability Insurance Co.
Irving Iron Works Co.
Dail Steel Products Company.
McNutt Can Sales Company.
Improved Aluminum Gasco Protector Company.
The Safety Machinery Corporation.
American Mason Safety Tread Co.
American Abrasive Metals Co.
W. P. Hitchcock Co.
Safety First Supply Company.
Chemical Toilet Mfg. Co.
Sectional Safety Stop Co., Inc.
State Insurance Fund.

A series of tables and charts, summarizing the activities of the New York Industrial Commission, were also on exhibition. The tables have been published in the Monthly Bulletin of the Commission for January, 1919.

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